COMPUTERWORLD

OSF changes emphasis to focus on 'middleware'

BY MARYFRAN JOHNSON

OSF/1 operating system devel-opment to concentrate the bulk of its resources on building disits resources on building dis-ibuted computing and manage-sent software, OSF President twid Tory confirmed last week. This shift in direction is cer-ain to be discussed at the OSF's emiannual member meeting his week in Munich, Germany.

fory is trying to steer the non-rofit, vendor-supported OSF ato a new role as a manager of o-called "middleware" technol-

work on its own Unix/Ultrix op-erating system. DEC had previ-ously halted work on new ver-sions of Ultrix in favor of an aggressive migration campaign to move Ultrix customers to

IBM set to outline PC revamp

Partnerships and cheaper, faster boxes key to regaining market share

BY MICHAEL FITZGERALD

Tools on way to track micro packages

BY ROSEMARY HAMILTON

CAMBRIDGE, Mass. — Two microcomputer software giants are readying tools that will help customers more easily install and keep tabs on desixtop software — tasks that are an increasing source of headaches for many information systems

inagers.

Lotus Development Corp. is planning to soon in-duce Lynx, a software distribution management. cation that will provide automatic el explanation that was provide automatic electronic distribution of programs and asset management. bilicrosoft Corps, meanwhile, confirmed last week that it will ship the initial version of Windows New Technology with the capability to "remotely install and monitor" distributions.

NetWare support still lacking

Host software price cuts aid few customers

BY JOHANNA AMBROSIO

WHITE PLAINS, N.Y. - IBM tware discounts of 5% to % — but in so doing ad-used the concerns of only its

gest customers.

The new pricing program ap-ies only to customers of the ratem/390 computer family he meet two criteria; They st have two or more different operating systems rurning on the same machine, and they



5-DISTT 48103

UNIVERSITY NICROFILMS INT SERIAL PUBLICATIONS

BY JIM NASH

PROVO, Utah — A year after Novell, Inc. launched a revital ized product support program, a random survey of 25 NetWare

AMR-led re

penView users to get th to OSF DME. Page 8.

INSIDE



IN THIS



· NEWS

4 CA sues First Fidelity over alleged software piracy. 4 CA acquires \$40 million developer Nantucket.

- ieveloper Nantucket.

 IBM doubles the numner of vertical applications for outry-level AS/400s.
- entry-level AS/400s.

 8 HP assounces an Open-View upgrade that allows smooth migration to OSF's Distributed Management
- Environment.

 12 IBM cuts price of OS/2 developer's kit and announces more than 25 pro-
- platform.

 14 UB, Networth and
 Novell team up to migrate
 NetWare to smart wiring
- subs.

 4 Microsoft signs fiveear deal with global carrier BT to manage its European
- s a to manage its European ub. 5 Infonet will soon cary SNA and other LAN proto
- 16 Interop '92 Spring attendees will likely flock to the frame relay and FDDI demonstrations, among othe technology exhibits.
- 16 Systems Center isunches products that mee IBM's SystemView and Net View lead on
- 24 TI releases its Super-SPARC microprocessor, which some say Sun will use in as-yet unannounced highend RISC workstations.

Quotable

C ompanies that pirate software "are very stupid."

CHARLES WANG COMPUTER ASSOCIATES

On his company's latest launcit. See story page 4.

DESKTOP

59 SPSS for Windows is sisted to hit the market soon

WORKGROUP COMPUTING 5 Amoco Canada h

65 Amoco Canada has overcome its network overload problems with an Epoch InfiniteStorage server.

ENTERPRISE NETWORKING

- 71 Three companies announce products for connecting branch offices with cornorate networks
 - LARGE SYSTEMS
- 81 Memorex makes its automated tape library available for smaller
- 88 New Product In-Site: Large corporate users report that IBM's ES/9000 Model 900 delivers on performance but falls short on fiber-optic Escon channels.

This week, Computerworld's new

monthly feature debtots. It will profor the product in Site of page in waiting of complete. New Product In Site goar
you did a standard product review by combining estimates input from lower of the same product which were of the same product with the complete with product in Site goar of the same product with the complete with product in Site in Site in the Complete with Product in Site in Site in the Complete with Product in Site i

APPLICATION DEVELOPMENT

- 91 GUI code generators are helping programmers.
 - MANAGER'S JOURNAL
 - 117 POS systems tell who buys what, where.

STRATEGIES

- 97 Small open systems specialists make big waves with IS shops that want fast
- IN DEPTH
- 111 A software and communications proposition for bringing laptop data into the desktop fold. By Anne S Kellerman and Palmer W.

DEPARTMENTS

- 6, 16 News Shorts 29 Advanced Technology 32 Editorial
- 32 Editorial 119 Calendar
- 122 Computer Careers
- 123 Fast Track 132 Marketplace
- 136 Stocks
- 137 Computer Industry 138 Inside Lines

EXECUTIVE BRIEFING

III IBM's restructured Personal Systems Group is revving up to produce a string of new PCs designed to win back market share and show that the company's woes are all ower on the desktop. However, analysts are questioning if the company has restructured enough to earn consistent profits. Page 1.

A changing role for OSF could affect major supporters — such as IBM, DEC and HP — as the organization de-empiases the strategic importance of OSF/I kernel development in favor of building distributed computing and management software. Page 1. As many as one in five IS departments is adopting open systems policies; while their approaches officer, they between mone platforms. The rewards include improved productivity, less equipment and lower training costs, amanager say, Page 97.

- M A Computerworld survey indicates attendees flocking to next week's Interror '92 Spring show seek standards compliance first and foremost for integrating multinortocal networks. SPSS.
 - ees users might s seir laptops, but ti e bow difficult it is n
- for them to integrate lapte for them to integrate lapte data into their deaktop env ronmenta. Companies cou use an environment in whic connection among computer is automatic and file maints nance software tracks and up dates data on all platform
- IBM discounts mainframe software prices by up to 20%, but the price break applies mostly to the largest customers. Companies have to meet conditions before signing up. Page 1.
- M Ever wonder what books IS managers read for inspiration? You may be surprised to learn they are turning to historical leaders such as Attila the Hun and learning from the missales of a failed Antarctic explorer.
- Lotus is planning to release tools that better minage desktop software distribution and upgrades. Meanwhile, Microsoft says Wandows NT will have some builtin capabilities to remotely distribute and monitor desk-
- CA filed suit again First Fidelity for breach of censing agreement and mappropriation of trade a

- urcrets. Page 4. It al
 less announced plans to acqui
 linlin Nantucket Corp., a develop
 cek of desktop database too
 irst Page 4.
- ele of desktop database tools.
 Page 4.

 If page 4.

 If SPSS, maker of the venerable statistics package, has brought a full-featured verthat sion of its software down to the PC in a graphical environment. Page 59.
 - Experience with NCR's Cooperation client/server environment shows that such cooperative processing can be beneficial, but it can also mean more work than users anticisate, Page 91.
 - On aite this week: Deeything changes, and base ball is no different. First the gane gave in cartifical furf and now the company that and now the company that from a proprietgy missifram to open opterior. Page 81. Amono Canada is more from a missiframe to a LAVb-basecton when data overwhelmed disk when data overwhelmed disk opins workstation users immegrae workstation users immegrae workstation users immeprise workstation users immeted the company of the company of Page 65. Six months slow the runway. Useted Airlines
 - server-based crew scheduapplication is accomplish
 what it hoped for, tho
 some issues such as sec
 ty have presented c
 y lenges. Page 68.
 newest big eye on the sky
 Hawaii, where microprosers on high-speed netw
 et control the precise positing of the Kock Observattelescrime's measure micro



THIS GIVES YOU A ROUGH IDEA OF HOW FAST SYNCSORT IS.



syncsort

CA sues bank on piracy charges

BY THOMAS HOFFMAN

NEWARK, N.J. — Computer Associates International. Inc. last week sued a major North-east regional bank holding com-pany, claiming it illegally used CA software managed by out-sourcing provider Electronic Data Systems Corp.

A software managed by outsurving provider Electronic
tal Systems Cope
The sait, filed in federal court
ex, charges Frant
felty Barocop

All City claimed ble best planted to the slegations better be concerned, and they'd best planted to the slegations better be paring structured. In the concerned to the concerne

customers — over the transfer of software licenses. The two earlier suits involve State Street Bank and Trust Co. and National Car Rental System, Inc. Officials at both CA and First Fidelity, which has \$29 billion in assets, provided few details on

software piracy. Companies that pi-rate software "are very stupid,"

servers said they believe users should take note of such legal actions by CA. "They'd

billion, accusing the outsourcing firm of software piracy and

EDS has worked with First Pidelity since September 1990, when the two companies signed when the two companies signed a \$450 million, 10-year contract. Under that agreement, EDS took 18 months to consolidate operations from two data cen-ters to one facility in Philadel-

Since signing on with EDS, First Fi-delity has acquired six banks and/or branches. EDS has



Keeping it legal

utsourcers and software vendors agree there is a problem with their re-lationship but do not necessarily agree on a way to resolve it. In the mean-

on a way to resolve it. in the mean-get caught in the crossfire.

That was essentially the upshot of an open-mike session in New Orleans at last work a an-nual meeting of the Information Technology an-sociation of America (TIAA), an organization

sociation or America (LTANA), an organization formerly known as Adapso.

At issue is how outsourcing firms can legally and ethically take over their clients' software li-censes in a way that fairly compensates the soft-

ware vendor.

During the let-it-all-hang-out session, which occasionally flared into angry exchanges, John Landry, executive vice president at Lous Bevel-opment Corp, in Cambridge, Mass. — representing the software vendor's side of the issues—said, "licensing is a very serious and multifacted since. Each company has a slightly different rspective." The biggest fear of a software vendor is tha

75%, as the Icome. "What about a 4531 toop of the best turns over to an outcomer running on a 600 ju supplication used by just that one slope's proper services in Step 1,000 just 1,000 just 2,000 ju

KOHANNA AMBROSIO

icts on time — though it some 300,000 Clipper li

CA to acquire Nantucket in bid to boost PC sales

ISLANDIA, N.Y. — Computer Associates International, Inc. last week signed a definitive agreement to acquire Nantucket Corp., the \$40 million developer best known for its desktop database development environment. Terms of the agreement were not duclosed.

The move is intended to help CA improve its standing in the \$10 billion personal computer software areas, an industry marginal processors. plications aupport at e University of North was in Denton. But, Capps said, the

software arena, an industry mur-ket in which CA's share is negli-

net in which CA a share is nega-pible, analysts said.

About 10% of the company's \$455 million in revenue for the third fiscal quarter ended Dec. 31, 1991, was PC aoftware-re-lated, according to Sanjay Ku-mar, CA's senior vice president

ed feelings about the acquisi-

"Retaining the development people at Nantucket would be my major concern, said Kyle Capps, man-ager of microcomputer At a

uisition could help stucket speed up dement of products, ch he said has his

mich as said this microlity been slow.

"They have a bad putation for being ow to come out with roducts, and I hope CA in address that in the iture," he said.

Future unclear

CA executives said they expect
Nantucket's development team
to remain intact, though no decisions have been made as to the
future of Nantucket's executive

ees. Also unclear is how Nan-tucket's Clipper products will be integrated with CA's CA-dRase development language for Microsoft's Win-dows. "Those are all issues we'll work with the Nantucket group on," said Charles Wang, CA's chairman and chief executive of-Larry Heimendinger, Nan-

At a glance . . .

Nantucket d: 1984. sident and COO: Larry He

1991 revenue: Approximately 840M. yees: 260. Product line: Clipper (installed bas 300,000); Nantucket Tools (shippe September 1991); Matt Whelan's C

tucket's president and chief op-

mber 1991), Matt Whelan's Compiler
at released).

(**Char Mehet Square
erating officer, said be believes

CALC — has not brought the
that Appen, a not peneration, company much market prethat Appen, a not peneration, company much market pre-

erating others, said he believes that Aspen, a next-generation, object-oriented Clipper product that is now in development, will be marketed as "complemen-tary" to CA-dBFast. Aspen will provide graphical front ends into Windows and oth-

ence.

"CA has been pretty inept at tackling the PC software indus-try," said Rich Finkeistein, pres-ident of Performance Comput-ing, Inc., a Chicago-based data-

er environments for users of Clipper applications. Kumar pointed out that Aspen technology could be used to build graphical user interface database applications for IBM's CS/2 20 — an environment in which CA customers have shown renewed interest — and Unix. "Unix is a key platform, just a Windows is a key platform." has some 300,000 Capper: I censees — made it an easy tar get for CA, Finkelstein said, Nantucket, like many smalle developers, is constantly con-fronting cash-flow problems which should be alleviated b CA's deep pockets, be noted.

CA and Nantucket executives would not comment on the avail-ability of Aspen-based Not budging
But the deal has not changed Finletteria's mind about CA's PC
software strategy. "CA has no
understanding of the PC marketpiace. They just take a different
Law
Acceptations declined to
elaborate on their PC strategy,
saying they do not want to tip off
competitors on where they will
spend resource." However, Heimen-nger said Nantucket

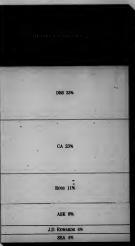
plans to generate revenue from these prod-ucts in fiscal 1993, which begins July 1, Others in the PC software community said they believe the The acquisition could give CA a second

community said they believe the acquisition has merit.

"It makes sense, considering what they're trying to do to sup-port multiple platforms while adding to their PC software products," said Nancy Leslie, a senior systems analyst at Gulf-stream Aerospace Corp., the Sa-vannah, Ga.-based manufactures of the Gulfstream let who is held of the Gulfstream let who is held.

THE FINANCIAL SOFTWARE MARKET HAS JUST BEEN TURNED UPSIDE DOWN.





According to a recent survey of Datamation Magazine readers conducted by Cowen & Co., Oracle Financials are turning the applications market on its head. And as the biggest players move down to make room for us, it isn't hard to figure out why. Oracle Financials are the modern alternative to the ineffective.

unresponsive financial software built in the 70s. They are, in fact, the only major financial software to be based on relational technology.

Which means that in a continually changing corporate environment, Oracle Financials can be quickly configured to keep pace

programming. So you always have the information you need to manage your business.

And like all other Oracle products, Oracle Financials run on virtually any computer you have today, or will have tomorrow. On mainframes, minicomputers, workstations or PCs; whether they're on terminals or

in client-server configuration. To find out more about Oracle's open family of portable software and the education, consulting and support services that stand behind

it, call 1-800-633-1073 Ext. 8168. We'll turn your present with reorganizations, mergers and acquisitions. All without ORACLE notions about financial software upside down.

Software for people who can't predict the future

NEWS SHORTS

Mixed bag at OSF meeting

RAILMOND BODG OF OSF meeting to Open Software Towards with May be one pool and bud were the week for its 360 member companies. The good were availability of the first developer's "insupants" of ba-bacted Mesugenerit Euvironness software, a minimendor he bud news: an infediment delay in the Architecture-Neutral stribution Format (ANDE), which promises to fire applica-vens from justicem depositions. The Direction Community april project will take over ANDE development, added by a gipt U.S. government research laboratory.

Did they or didn't they?

Ing. C. Divetti & Co. reported last week that McDossid's Core, had tapped it to supply more than \$300 million in advanced paint-of-sale systems for its 12.000 restaurens worth-based points of the systems for its 12.000 restaurens worth-based provised companies featuring fill spead, touch-tores displays connected to this severe. But McDossid's reported displays connected to this severe. But McDossid's reported displays connected to this severe. But McDossid's reported Olivett's chim the 'utili install \$5,000 modistations at 8,000 million and and displays connected to the severe. But McDossid's reported of the severe in the displays connected to this severe. But McDossid's southern the severe in t

Claco branches out
Caco Systems, Inc., last week took strides to accommodate remain stress with teconomications services limited to the
follow technologies network. It innounced is 1239-96-90rt inmarks in said to induce terminal service by adding an asynchronous internet Protocol (IP) moter for creating add-up IP
router activate; translation services between devices remain
the fail array of virtual terminal protocols; and support of seri3-the protocols for large and X terminal terminal

Perot nobs \$18 in outsourcing pacts Herndon, V.-based Peret Systems Corp. said it recently agained two European contourning contrast worth a combined \$1 lation. Under a 10-year deal with Pure-based European, common is IMB Enterprise. System/9900 and 3090 3005 common is IMB Enterprise. System/9900 and 3090 3005 based operations into Unit platforms scattered around 1,000 sizes. A12-year deal with ICR sased East Mildons Described calls for Perot to take over the company's Andalsh Corp. 1400A-based data contex.

Infonet 'the very best' for Nestle
sate Sh has selected infanet Services Corp, to interconnect
general electrons canni systems injenemented at the foot
among sometime the continues the same selection
among incompatible E-mill systems. Nestle's long-term
mail grain include reducing first and teles costs by 30%, instraig to CCITT. Kollo, implementing electronic data intertage ladas with business partners and boosting the current
000 mallouses to 6000 during the nest three years.

Short tarkes

Amidal promote Protein Dough Ermin. (1. to claif ormote Protein Protein Ermin. (2. to claif ormote Protein Protein Ermin. (3. to claif ormote Protein Ermin. (3. to claim and the claim and the

More news shorts on page 16

Travel system delayed til '93

Car/hotel/airline reservation network experiences compatibility snafu

BY CLINTON WILDER

DALLAS - Admitting that it bit off more than it could chew, a or travel industry partnership has announced an 18-month delay in the rollout of its vaunted vations system after more than three years of development

The International Reservations and Information Consor-tium (Intrico), which oversees the development project, discov-ered major problems earlier this year when the system was betatested at Hilton Hotels Corp., one of four consortium mem-bers. The system's first phase,

part of what was once billed as a \$50 million project, was sup-posed to be ready in the current quarter; instead, it will roll out at the end of 1993. found that the system's three major components — user inter-face, mainframe transaction pro-

cessor and mainframe database — did not adequately commun-

Integration solution Confirm, developed by consor-tium partner American Airlines' division AMR Information Serdivision AMR Information Services, Inc., has been billed as the first system to fully integrate hotel, restal car and airline reservations. Other members of the Intrico partnership, formed in late 1988, are Marriott Corp. and Budget Rent A Car Corp.

"In 20 years in the beautiful partnership of the partnership of the partnership of the partnership." "In 20 years in the business

this is the most complex integra-tion challenge I have ever seen," said Charles Biebighauser, vice president of operations at Intrico. "We had 500 technical cople working on this, so the chance for miscomm was fairly large."

N 20 YEARS IN the business, this is the most complex integration challenge I have

CHARLES BIEBIGHAUSER

Confirm runs on two IBM 3090 mainframes, one housing the central reservations system in a Transaction Processing Facility environment, the other running an MVS-based DB2 database containing decision support information such as custom-

The system depends on appli-cation-to-application bridging between the CPUs for some 60 applications, which was a far more difficult challenge than en-ticipated, Biebighauser said. "We must make sure everyone is coordinated in terms of the internal transactions — who has dies them, when does the open ating system get involved and when does the application get in-volved," he said.

code generator to write the MVS-based code, but it ran into problems using IEF to develop

ty.
"IEF will not generate the right code that we need to make that ffront end] work correctly, so we have to replace some of that," Biebighauser said. "That is another fairly substantial inte-

gration problem."

The front end will also interface with the five major airline reservations systems and all user terminals and management systems that run in customers'

systems that run in customers' hotels.

Biebighauser said intrico will not add more people to the te-velopment project but will bring in more experienced managers from AMR Information Ser-

He noted that Confirm's onit-inal four-plane, nine-month roll-inal four-plane, nine-month roll-inal four-plane, nine-month roll-month of the confirm of the con-trally alternatives. See a see a see a ready alternative consent said that the firm plane to darp almost with 50 com internal reservation systems and does not believe the will be any angiture effect from the Confirm delay. The confirm delay.

IBM doubles number of Plug'N'Go applications

BY KIM S. NASH

WHITE PLAINS NY ... IRM doubled the number of turnkey solutions available for entry-lev-el Application System/400 E se-ries models last week. The move res models last week. The move filled a few application category gaps, but the packages are aimed mainly at small business niche users and value-added resellers. Fifty wertical applications, sold either individually or bur-dled with AS/400 9402 Model

E02 or Model E04 machines, are now available under IBM's 8-month-old Plug'N'Go program.

IBM also announced that users can order WordPerfect Corp.'s

can order WordPerfect Corp.; flagship word processor predicaded with hundled setups. The shrink-wrapped Ping'N-Go scheme is not a primary mover of AS/400b but is a response to demands from small customers, such as purking garageagencies and property manageagencies and property manager of the program. He declined to provide sales figures.

ines, director of midrange rategies at Technology Invest-ent Strategies Corp. in Fra-ingham, Mass. That means at while the number of units ld may be high, the dollar ant is relatively low, he ex-

phained. Among the new offerings are accounting, public sector and distribution packages written by third-party software developers. Pug NY Go System Sodutiens, which come with a 90-day mency-back guarantee, are bundled application, an ED2 or EO4 machine, OS400, Personal System/2s and other perspherals and utilities.

Prices start at \$24,000 for the new offerings. New individ-nal Ping'N'Go Application Solu-tions range from \$1,295 to \$19,500.

There are 238 ways to manage your health. But only one way to manage an entire network. Your way.

For everyone saying they'll keep you fit and trim, there's a software vendor saying they'll manage your network. But only Systems Center products really let you manage the network you've built—the way you want to.

Our approach is truly peer-based—IBM®, Tandem®, Digital®, AT&T, and Fujitsu®. You make use of the network management tools you already have. And, you control your network from the point that makes sense for you.

Our products automate the routine parts of network management, freeing your staff for more important tasks. At the same time, they'll find our approach is easy to learn, because it's built upon a rule-based, 4th-generation language.

If Systems Center products sound like the edge you need, call 1-800-533-5128 to schedule a presentation, or for more information. As soon as you finish your workout, that is.





capabilities into NetView/6000 before the product can support Travelers' full range of network-ing products, Layland added.

ing products, Layland added.

HP's OpenView 3.0 announcement, due out next month, incorporates a common, DME-complaint GUI based on specifications that HP submitted to OSF. It also provides Simple Network Management Protocol (SNMP)-based management

services.
This week, HP will amnounce an OpenView SMMP developer's platform and tool kit third-party developers can use to the third-party developers can use to the their packages to the above services and DME-compliane GUI. Independent software wedor products that are written to OpenView 3.0 can migrate with "minimal changes" to full DME compliance once the standard is

pliance once the standard is ed. HP spokesman Jeff

HP will also unveil OpenView Network Node Manager, which provides the above capabilities

as an end-user application, priced at \$15,000. Both offer-Also this week, HP will announce Open View Management Platform Release 3.2. Scheduled to ship in the third quarter, the

OpenView promises to deliver

PALO ALTO, Calif. — Hewlett-Packard Co. last week as-noanced OpenView 3.0, a week as-noanced OpenView 3.0, a week wersion of its OpenView network measagement platform said to provide users with a smooth mi-gration path to the Open Soft-ware Roundation's (CSF) Dis-tributed Management Environ-ment (DME). It is slated to ship in lane.

in June. The samouncements put HP ahead of competitors and OSF co-founders— such as IBM and Digital Equipment Corp.— when it comes to providing a truly open network management platform, said James Herman, principal consultant at North-east Consulting Resources, Inc. in Beston.

can commany school received in the control of the c

OSF changes focus to push middleware

changing role is unclear at this stage. Tory is still drumming up support among major sponsors such as DEC and IBM, who are being asked to provide more of the future development work on OSF/1. "It's a shift from OSF being the engineer, to being more of the project manager," said Donna Van Fleet, personal systems director of programming at IBM. "It seems to me to be a very natural evolution."

wery natural evolution."

Another priority for the member companies is OSF's coetaming work on macredarmel exchanges, which will eventually enable a single kernel portable to many different hardware platforms. "We don't want OSF to back, off the kernel." Yan Fleet said. "We are very much in agreement on continuing investigations."

Kornel truce Several industry analysts said OSF's changing emphasis sig-nals the end of the Unix kernel

nais the end of the Unix termed wars, with AT&T's Unix Sys-tem V Release 4 operating sys-tem emerging as the victor.
"OSF has to find a face-saving, way to attep away from OST, because System V Release 4 is, the preferred kernel," said Kete Fessenden, an analyst at Meta Group, Inc. in Westport, Coen. OSF plans to hang its future

and systems manage-ent strategies to DME. "It's rd to be committed to DMF and there are hard to be committed to DME. "It's when there are no products," said flobin Layland, manager of Systems Network Architecture (SNA) software engineering at The Travelers Corp. in Hart-ford, Conn.

Drewn by promises
Bowers, several network man-agers in Fortune 500 companies
have expressed a strong interest
in what DME promises to pro-vide: the ability to manage a wide-range of networked systems via a broad range of their party net-and a common application of their control of their properties. The seventh of their properties of their properties of their terface (GUI). Travelers, for example,

Travelers, for example, wants to use IBM's Net-Wew/8000 — which is based on HP's OpenView — as an integrated management system for its local-area network and LAN interconnectivity devices, Lay-land said. However, IBM needs to incorporate additional Open-View elements as well as DME

vironments."
Many users seem to agree.
"My main interest is in DCE
and DME rather than operating
system areas," said Duane Eims,
program manager of technical
computing at General Electric
Co. in Fairfield, Conn.
At John Hancock Financial
services in Boaton, a corporate
memberahip at OSF is being considered because of interest in

sidered because of interest in DCE and DME, said Sally At-

DCE and DMEs, said Sally Al-kins, a consultant in technology directions and research. Bill Conley, namager of infor-mation technology services at Loral Aerospace Corp. in New-port Beach, Calid., added. "The original resense for OSF" or creation have kind of gene away, but in the meantime, they we done some really next things like DCE.

Users will also start noticing

more solid evidence of true coop-eration between OSF and its onetime archenemy, Unix Sys-tem Laboratories, Inc. (USL), which markets Unix System V on development of the Distribut-ed Computing Environment (DCE) and Distributed Manage-ment Environment (DME) soft-ware technologies, considered e operating system and the ap-

based USL announced how it will incorporate the OSF's DCE into its own plans as a reference im-"No one cares what the ker-nel is anymore. All of our layered el is anymore. All of our layered echnologies are increasingly iding the operating system, ory said. "The customer defini-on of open systems is inter-perability over multivendor ention to run on System V

USL's general direction these

Last week, Summit, N.J.-

agement services across multi-ple management stations. Support of the DME Consoli-dated Management application programming interface, which enables one application to mun-age network systems that com-ply with either SNMP or the Open Systems Interconnect Common Management Informa-tion Protocol, IRP said.

days "is to deliver product im-plementations of OSF technol-ogies," said Joe Menard, direc-tor of marketing at USL. Both OSF and USL are working on a single specification for a com-mon set of application program-ming interfaces that will essentially unify the two operating

"That is really incredible and very positive step," Atkins

While OSF has always sub-contracted or farmed out some of the technical work on OSF/1 and other software projects, the

Points to ponder

DME can be summed up by the following points: · Common GUI across different network management applica-

tions and services.

Benefit: Network managers can use the same windows-based
GUI to invoke a range of management functions and applica-

Consolidated application interface.
 Benefit Manage a wide range of networked systems via either the OSI-CMIP or SNMP.
 HP support: Third quarter.

O Object-criented application interface.

Benefit: Automated administration and management of multivendor "Objects" such an network devices, systems, applications, files and databases.

HP support: No time frame.

platform will provide the following capabilities:

**Distributed Management Platform, which is said to support data for reporting and analysis, distributed SNMP-based management services across motion.

**HP also amounced that about the plant page of the plant page of the plant page of the plant page of the plant page.

**HP also amounced that about the plant page of th

unassasses trast can ster be steed to collect network management data for reporting and analysis. The collect network of a additional latter party packages now support Open View. One notable newcomer is OpenSVA from Peregrine Systems, Inc. in Carlabad, Calif. Stated to ship by midyear. The product is said to tag IDM VIVAM for SVA management OpenView management sterver, Pricing was not available.

proportion of outside work has been climbing iteasily over the past year, Tory and year, Inc., do the actual work. Edd, for cample, be clight activate technologies included in DCE.

Analysts give OSF high praise for coalescing the major industry players around attandards and producing some widely accepted technologies, such as the Mod I

DEC renews interest in Ultrix

"Bug at the wrong one, ladey. Uh hale?"
That text on the propoler Page commercial months of the proposer Page commercial months of the Commercial for the Commercial

well, in-house with its own resources. Event-lation to loss product be added.

Indicate the computed to be added.

As to the new resource of a computer of the added and the computer of the

MARYFRAN JOHNSON



Largest worldwide RDBMS market share: 30%



Fastest benchma: ever: 1,073 tpsl -Codd & Date



First RDBMS to validate ANSI/SQL level 2 with integrity enhancements an FIPS flagger -NIST



Most open client/serve RDBMS: 178 platforms 28 networks,



Pirst RDBMS to run on a massively parallel supercomputer



astest benchmark on a VAXcluster: 425 tpsB



Fastest benchmari on a VAX 6560: 153 tpsB



Largest worldwide DEC VAX VMS RDBMS market share: 51%



Fastest benchmark on an IBM-compatib mainframe: 416 tps -Codd & Date



Largest worldwide MS-DOS and OS/2 RDBM: market share: 41% -Gartner Group



Fastest benchmark on a UNIX minicompu 319 tpsB



Largest worldwide UNIX RDBMS market share: 47% Gartner Group

WHY YOU SHOULD CONSIDER ORACLE IN THE FIRST PLACE.

An overwhelming number of firsts. An impressive range of first-rate education, consulting and support services. They all add up to make ORACLE the worlds #1 RDBMS. So put first things first and call 1-800-633-1071 Ext. 8174.

ORACLE

Software for people who can't predict the future.

Host software price cuts aid few

NTHVED PEARLY PAGE 1
shillses, including those with Anndald
rp, processors, we also eligible,
container and industry rescises to the
n was missed. While contourers and
seals from IBM, effect offerers and
coals from IBM, effect offerers and
coals from IBM, effect offerers and
contained of IBM aniforms continues
contained of IBM aniforms continues
coaling of IBM aniforms of IBM
coaling of IBM
coali

IBM's customer base, including some of IBM's largest users. But, he said, "this may [inspire] customers to consolidate" two or more enisting operating systems onto one large computer, thus making them eligible. "We're amoious to see what actions they take."

Mide application
This could apply to several of our sites,"
aid William Dean, director of technology
namagement services at Pepsico, Inc. in
Purchase, N.Y. "Obviously, we would
velcome it because we'll take everything we can get. But the essence of the prob-

lem remains the built-in tier crosp that in an impediment to augmenting our final-raneel capacity. Remained capacity framed capacity. Remained capacity from the Nevertheless, Coddlers; defended the Nevertheless, Coddlers; defended the Nevertheless, Coddlers; defended the New Land Coddlers; defended the New Land Coddlers; defended to the sense that the content of the codd processor complete that the total processor complete that the Coddlers; defended to th

cossumes (CW, March 2).
Goldberg characterized this as "Sysplex" pricing, referring to the IBM Sysplex idea that allows customers to link multiple computers together and run them as one giant complex. Goldberg would not say when this pricing scheme and this international.

Rebert Delaney, vice president at the Principal Plannical Group in Den Moines, look, and the new princip data does not one, and the new princip data does not looking forward to the Syngiac-based scheme. That is new attractive environment toom, "Delaney and," the scheme paid, "Delaney and," the principal data of the principal dat

sign a document.

PR/SM.

Still, some industry watchers were skeptical. "This is not a pricing announcement as much so it is a way of making customers' commitments to multiple operations as inexpensive as possible,"

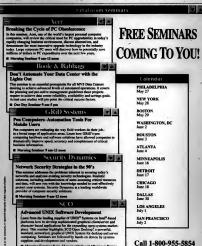
"Manual."

comparent. These in ord; proving interesting content of the proving interesting regimes in societies, and in content of the province of the pr

CORRECTIONS

A story in the April 27 issue incorrectly, referred to components used in IBM's Enterprise System/9000. The technology should have been called thermoconductive modules.

A story in the March 9 issue about FDDI over copper wiring said that standards committee work with plastic fiber was nearing completion. That work reported-by in being done with lower-cost glass fiber alternatives. An estimate in the article ly is being oase—attentives. An estimate in the article about current copper wiring installations attributed to standards committee vice chairman Floyd Rotes should have east that by the time an FDDI standard for shelded copper wiring is complete, it should satisfy 90% to 50% of the demand for 100M bit/sec, networking.



WordPerfect for Windows

This showcase spetlights WordPerfect* for Windows." and innovative complementary products from many of the industry's leading vendors. You will examine trends in word processing and discover valuable tool

Word Processing Showcase

for FREE

or More

Registration

Information!



Put Your Programming on the Right Track, Attend the 1992 Micro Focus User Conference.

Micro Focus Application Developers, Project Managers, Team Leaders — Are you taking advantage of the latest Micro Focus programming tools and techniques? What do advances in COBOL technology mean to your site? How can you program more productively?

Micro Focus International User Conference May 18-21 at the Santa Clara Convention Center, Santa Clara, California will help you answer those questions and more:

The educational tracks set up for the 1992

Listen to Industry Experts — Do you need more information on today's popular operating environments! Key representatives from IBM, Microsoft and X/OpenTM address attendees in daily general sessions and discuss programming issues relating to IBM® OS/2TM, Microsoft® Windows™ 3.0 or UNIX®.

See The 1992 Micro Focus Products — The latest releases of Micro Focus COBOL/2, COBOL/2 Workbench, Dialog System and other Micro Focus products will be unveiled at the conference and you will learn about the new features that can increase productivity at your site. Speak With Micro Focus Developers—
Micro Focus Executives as well as Technical and
Support staff members will be on hand throughout
the conference soliciting customer feedback and
addressing specific issues of concern to the business
application development professional.

Attend Valuable Technical Sessions — The 1992 Micro Focus Users Conference offers over 40 technical sessions covering a broad range of programming and development issues including:

- Cooperative Processing
- Client/Server Technology
- Programming for Open Systems
- DOS, Windows and OS/2 Programming
- Customer Case Studies

The 1992 Micro Focus User Conference is open to all current Micro Focus customers. Call the Conference Desk at 415-496-7356 to receive your registration packet and learn about 'A Better Way of

MICRO FOCUS

Micro Focus Inc, 2465 East Bayshore Road, Palo Alto, CA 94303 415-856-4161

IBM set to outline PC revamp

er versions of IBM's own SLC chip — for its ex-oks in late summer

Analysis agreed that IBM, which has sold 13.9 million PS/2s since the line was intro-PS/28 since the nne was mixture daced in 1987, must continue its push toward pricing its products competitively with close mak-ers. IBM has made significant strides in reducing prices, but

most observers said its pricing must still improve concern is whether [BBM and Compaq] are joing to produce workstation and deathep products that are going to be price-competitive with Dell and General, Top tell as they are, but the proof is in the profiling," asid William Tasacher, chairman of ComputerLand Corp.

Tolk is cheep
"They talk stuff, but I haven't
seen snything solid yet," said
Robert McGloughlin, assistant
vice president of PC procurment at New York Life Insurance Co. "It takes time, I know,
but I haven't seen the actual
changes yet. I'll be optimistic
and say they're coming."
Sources agreed the new IBM
was coming but said it might
have a high price.

was coming but and it might have a high price. Peter Kastner, vice president at the Aberdeen Group, a Booton-based consultancy and market research firm, said be sees more bottom-line troubles. "Even Appe, which dedicated itself to this model, needed a year and a bail of decreasing margins and cutting expenses." Kastner said. "The implication for IBM being: more restructuring."

IBM adds programs, cuts OS/2 kit pricing

SAN FRANCISCO - In an ef-

Pelt-Layman indicated, how er, that IBM's presence of anguServe certainly left roor r improvement. "The Compu-erve support is a joke," he said.

Tools on horizon to track PC software

"This is a tremendous issue for us," said Joseph Herrin, di-rector of systems development at Joseph E. Seagram & Sons, Inc. "We attempt to keep as in-ventory, but that's really diffi-cult, as users move around and machineschange hands." Industry analysts said soft-ware management is an increas-

ware management is an increas-ingly critical issue because of the mix of operating platforms and htmare out of the task of de-

"This is an area where there really a need for good prod-ts," said Frank Michnoff, a ram director at Meta ap, Inc. "Users are upgradin applications on masse, like then they move to Windows furthermore, they are down anding in-house code and distributing it down to the desktop. There's a tremendous need to manage all this."

Price Waterhouse claims it has been hounding its vendors to bring it some relief by providing this kind of technology.

this kind of technology.

"We were one of the people
who yelled at [Lotus] to do this,"
said Sheldon Laube, ustional director of information and technology at Price Waterhouse.

"We do it by hand, [and] what we

do now just doesn't work," be said of the firm's software man-agement efforts. "No way in an organization with 11,000 PCs can you easily manage the soft-

According to users and analysts, the Lynx software will tackle the following issue

ake sure we are in compliance aving a system to centrally

laving a system to centrally namage this would give us a preater level of compliance." Canadian Railway has set up a central function to keep track of software upgrades and versions. lowever, it still physically in-

Notes distribution goes electronic

"AN ARCHITECTURE OF POSSIBILITIE IS ROOTED IN THE CONSTANT OF CHANGE"

The control of the co

to the control of the

high performance do not ensure camp, ting, on argament. The flexibility of modify the anningtions builth as your burness and

ce ca 180 8 SYBASE

SYBASE

CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

Microsoft outsources European hub

BY ELISABETH HORWITT

EDMOND. Was — Maries of Gorph to picket the region of Gorph to picket of Gorph to p

three interexchange carriers that it currently uses, be added.

Motivating all of the above moves is the software vendor a need for 24-hours—day, 7-day—aweek network reliability, coupled with a corporate limit on the hiring of new bodies, Monteleone said.

ed network tech cians, he added. Monteleone said the BT deal saved him from hiring between 7 and 10 people to oversee the Eu-

ean network. Not that Microsoft intends to Not that Macrosott intends to une connections that ratiate our turn over network control en-tirely to carriers. The company of Postal Telephone and Tele-will continue to have eight tele-communications people in Eu-rope and Detween two and six said.

people on shift at its network control center here. The control center will use Ungermann-

center will use Ungermann-Bass, Inc.'s NetDirector to mon-itor remote local-area network hubs, Monteleone said. Microsoft has placed a high priority on ensuring reliable,

for its European net-work, which handles approximately 3.5 million electronic-mail messages per month and serves 1,600 employees at 13 subsidiaries and 22 networked sites,

the company said.

One unusual aspect of the Microsoft/BT contract is that BT has committed itself to providing

Smart hubs to pick up server functions

BY JOANIE M. WEXLER

Uners trying to integrate work-group management and security-isol to their enterprise networking schemes while freeing up over-burdened file servers will soon be able to redocate server func-tions of the servers will soon to a server func-tion of the servers will soon to the servers will soon be able to redocate server func-tions of the servers will soon to the servers will see the Ungermanne Beas, Inc. and Network, Inc. —of which UB is a 50% owner — said last week they have less than the servers will be server wire the servers will be server wiring centers in Au-gust.

gust.
Shifting the way distributed network services and applications are deployed and managed would integrate the administrative strengths of the traditional glasshouse with the desktop diversity achieved via client?

achieved via client, server computing. With the hub and server run-ning Net Ware, manage-ment of the devices car be integrated so that one department — like-by information. consultant at Avon Products, Inc. in Pasadena, Calif. Against this backdrop of com-

Against this backdrop of com-plaints, Novell tast spring spear-headed the Technical Support Alliance, which now comprises about three dozen firms includ-ing Intel Corp., IBM, Apple Computer, Inc. and Borland In-ternational, Inc. Allies péded to take responsibility for pro-lems brought to their doors, even if resolution led customers to another allies. one department — size-ly information systems — can relieve scattered units of their server management duties.
"This scheme will allow us to funnel all management through our network group," said Greg Parcel, project manager at the Chicago Board of Trade, a large

to another ally.

But these efforts have failed to convince many network managers that much has changed. We're not aware of (the alliance]," said Tracy Currie, senior ance, san Pracy Currie, sensor network engineer at pharmaceu-ticals giant McKesson Corp. in San Francisco. "I guess that speaks volumes about it." Lead-ers of two large NetWare user

Product project manager is two UB stop been or the concept. Though some analysts and they anticipate turb thatles be-tween local-area network identi-nators in all St. managers who, most of our departmental people will be lappy to give that task sp. "Parcel land. Dame Marray, whe president between the product between which was a second of the well's Network Management for the vall's Network Management for the Management Interface specifi-cards into its nervers but Octo-cards into its nervers but Octo-

Locking the equipment Dennis Bogart, senior network design engineer at Fluor Damiel, Inc. in Irvine, Calif., said be tried to get assistance through alli-ance member Usgermann-Bass, Inc. but found that it "didn't. distributors can be tricky. Some-times they don't care' about solving the problem, explained bowle Hissh, data processing managers at Carlo Soil Control, plained about distributors and resellers that often only swap out parts rather than think through problems. "That's not true maintenance." That's not true maintenance." The support former and control of the control of howest a certification program, which certifies hell Ware engine. even have the latest version of NetWare installed at the office I called." called."

While the Technical Support
Alliance, in particular, deviates
from Novell's firm policy to encourage cuatomers to find support through distributors, resellers and certified NetWhre
magineers, it appears that many
users would just as soon have
have have been off the notified.

ber, "we only told you half the story. Now we're going the oth-er way — to move Net Ware into

er way — to more NetWare into hash for our large outformers."

UB advocates moving communications-related services, such as routing and messaging, to the hub, although any NetWare Loudsble Module (NLM) or other NetWare Speciation could reside there, said Joe Hielscher, a UB strategic

NetWare packs its bags



sepirations shift into the more properties assisted in the parties maintained and the parties of the parties of

neers annually, "That's helped some, but by no means does it clean up the whole game."
"Novell doesn't have my vote of confidence on support," and to confidence on support, and to confidence on support, and to confidence in New York. "Calling Novell direct in difficult and ridiculously expensive." Glen Farrell, an analyst/programmer at Prustone Textles, a Wood-stock, Ontario, division of Bridgetone-Prestone Canada.

Novell NetWare support still lacking

manager of network services at the M. D. Anderson Cancer Cen-ter in Houston, decided to be-come self-sufficient. "It was less Novell than the resellers." Kohnen, said, adding that plod-ding support forced the hospital to build its own service team two years ago. "We're the world's largest cancer treatment center.

years 400. "We re the world's ingrest cancer treatment center. We can't [afford to] call someone and wait for an answer."
Novell needs to innovate with support the same way it has with software, said users, who were clearly not impressed with the

Novell community's support of-ferings to date.

Network administrators com-plained that direct support is ex-pensive and can be slow. Indirect support can be shoddy and un-

Another problem, users said, is that there are just not enough qualified network experts to go around. "There are all these layers [of complexity with NetWare networks] that require a lot more [support] people;" said Winston Leong, communications

Customer satisfaction?

espite user complains. Chad Alleed, Novell's director for director markening and Novel's a dong the chair of order to red in evite markening and Novel's adong the that it classifies as "markelined celebrate the large wheth can re home \$100-per-indent telephone work's cost in her \$100-per-indent \$100-per-indent telephone work's cost in her \$100-per-indent \$100-per-indent telephone work in \$100-per-indent \$100-per-indent

figures. Novel's services and support vice president, Richard King, chaired that average problem resolution times have fallen to 30 ot 65 minutes. And according to Affred, the company sinternal customer-astifaction rating for Net Ware is approaching 4.0—the highest score. Affred said the rating has increased from 3.42 in January 1991 to 3.85 in March.

an jamuny 1991 to 3.85 in March.
Users interviewed recently countered those statistics with reports of inaccurate and delayed answers. For example, it trying to get help with the access severe. Beverly Strother, a technical analyst at Southern California Gas Co., "weited on the line, and then got an answer delay" taken The access sorres of (howell 5)% to money-maker. Now it as at a dead end."

groups said they could not point to a single member who has

Infonet melds LAN, SNA traffic

BY ELISABETH HORWITT

EL SEGUNDO, Calif. - Insectionary, call. — In-sired by unern seeking to move optications off the mainframe and onto local-area networks, in-net Services Corp. last week aid it will soon carry IBM Sys-ms. Network Architecture NA) (SNA) transmissions, along with several additional LAN protocois, between its customers' sites worldwide. However, the company said it is still evaluating which underlying technology to me in order to provide the ser-

to begin offering by year's end will allow customers to integrate SNA and LAN interconnectivity

will allow contoners to integrate will allow control to integrate over the same links, according to an Indianet spokemens. The sort will shall always in 18 miles with a support 180-180 miles with a support 180-180 miles with a support for 180-180 miles with a supp ice already supports Transmis-on Control Protocol/Internet rotocol (TCP/IP) and source

oute bridging protocols.

Infonet also said it has adden nfoLAN bubs in Australia, Den sark, Ireland, Italy, Japan, Spain

ad Singapore...
A recent survey of 100 Eurotan corporations by The Yastan corporations by The Yastan Corporations by The Yastan Corporations and that 30% of respondents
spect a major move to LAN inretworking within the next

Corporations such as J. P. Mor-pan & Co. and most recently Mi-prosoft Corp. have outsourced heir LAN-to-LAN buckbones to r LAN-to-LAN backbones to sel carriers, primarily be-se they do not want the ex-se and trouble of implement-and managing their own ate networks.

Mips Computer Systems, Inc., ed to InfoLAN about 18

moves to insolar, asout 18 months ago to interconnect its TCP/IP LANs, said Victor Fischer, director of MIS at the Sunnyvale, Calif.-based supplier of reduced instruction set com-

witing systems.

The company had been using infonet's X.25 service but discovered that protocol overhead was taking up as much as 75% of



Announcing Three New Modems From Multi-Tech

The best just got better! Our newest intelligent moderns, the MultiModernIIs, give you more performance and value, in a smaller package.

There's A Whalti Modene' For You

- MT224 Series: Our 2400 bos error-correcting, data compressing workhorses.

 MT932 Series: 9600 bps V.32 modems - full standards
- competibility and extraordinary performance.

 MT1432 Series: 14,400 bps V.32bis, for your most demanding high-speed applications.

The new MultiModemIIs feature V.42bis "4-to-1" compression and 9600 bps fax capability (optional on MTZI4 Series). The 9600 and 14-4K bps modems include special settings for UNIX® UUCP or IBM® AS/400™ applications. And with their new aluminum chassis, low power consumption and extensive use of VLSI surface mount technology, all three modems are built to last!

And that's not all. Please call us at (800) 328-9717 (in Minnesota, (612) 785-3500) for more information.





lock Systems, Mr., 26.7 85-1900, 1900) 328-9717, U.S FAX (612) 785-9874 85-1900, 1900) 328-9717, U.S FAX (612) 785-9874 avoid Toke 4995372, International FAX (612) 331-3180

COMPUTERWORLD

NEWS SHORTS

CHICOPP picks MCI
The first major fruit of Clickopy's setwork consolidation program amounced last fall [CW, Nov. 18, 1991] locked in last
work when the banking giant selected MCI Communications
cape, as the primary carrier for in domestic wice services. A
Clickopy difficial estimated that the services package will now at
Clickopy difficial estimated that the services package will now at
the \$250 million contract.

Focus gets query/onalyzer
The west at the International IDE there Group Conference.
The seven is the International IDE there Group Conference
than the International IDE and International IDE and IDE

Short better.

Through Jame 30, DEC will also free versions of Lectus Deburgh Jame 30, DEC will also free versions of Lectus DeDec 30, DEC will also free versions of Lectus DeJames James James

Users urge protocol coalescence

BY JOANIE M. WEXLER

WASHINGTON, D.C. - Multi ple communications protocols are likely to flourish on corpoder of the decade — a fact of life forming the major impetus behind the attendance of an ex-pected 20,000 networking pro-fessionals at Interop '92 Spring

Given the hodgepodge nature of today's networks, it is not sur-prising that a Computerworld survey of more than 200 technical managers seeking network glue at the last Interop show, held in San Jone, Calif., revealed

held in San Jose, Calif, revealed that compliance to communica-tions standards was the key fac-tor driving their networking strategies (see chart). "We have a mixed [protocol] environment, so adhresace to standards for interoperability is our most important consider-ation," said Robert Gulett, a net-work analyst at Allied Van Lines. work analyst at Affed Van Lines Inc. in Naperville, Ill. Protocol staying power at Al-lied is reflected in a rising use of Transmission Control Protocol/

Internet Protocol (TCP/IP) and Novell, Inc.'s IPX. In addition, the firm intends to grow its IBM Systems Network Architecture (SNA) network by 25% during the next two years, Gulett said. To help users cope, Interop '92 Spring focuses on vendors'

prise networks via myriad tech-nologies, allowing users to ob-serve that "islands of automa-tion have evolved into coalescing

prop, Inc.

Frame-relay and Fiber Dehoated Data Interface (FDID)

Interface Data Interface (FDID)

Major issues affecting networking strategies

Adherence to standards	.867
Reliability	777
Security	72%
Multiprotocal routing	.70%
Integrated network management offering	66%

Based on survey of 222 nonenhibiting attendies of Interop '91 Multiple responses offered

months.
FDDI topped the charts with FDDI topped the charts with 44% of the respondents planning to deploy the technology, com-pared with 41% of users plan-ning on frame relay, 21% looking into Switched Multimegabit Dats Services (SMDS), and 18% planning on new X.25 deploy-

Bells chlene in At the show, the regional Bell operating companies plan to de-tail their rollout plans for these technologies, said Robyn Aber, a product manager at Belloce. However, she said, SMDS will be getting more attention thain frame relay in the short

networking vendors such as Cis-os Systems, Inc., 3Com Corp. and CrossCom Corp. will democ-strate receivity amousted fra-tures for handling IRM traffic. On the LAN side, according to the survey, FDDI as a work-group network is slated to be survey of 50% of the respondents 18 months from now. Token Rimg networks at 4M and 16M bit/sec. speeds will be in use in connection during the next 18

Rimg networks at 4M and 16M bit/sec, speeds will be in use in 30% and 37% of the respondents' networks, respectively, during the same time period. Not surprisingly, 96% of respondents will have TCP/IP installed in the next 18 months, but an unexpected 55% will have Open Systems Interconnect installed.

Non-Stop competition for SystemView

BY ELISABETH HORWITT

RESTON, Va. - Systems Cen-RESTION, Va. — Systems Center, Inc.; is expected to introduce a quiverful of network and system management products next weak that it hopes will inflict some serious competitive damage on IBM's System View and NetVere packages. Systems Center and Tasdem Computers, Inc. will jointly reviews to Nos-Stop Net/Master, which will enable users to manage both Tandem and IBM networks from a Tandem host.

age both Tandem and IBM net-works from a Tandem host, ac-cording to James Herman, principal consultant at North-east Consulting Resources, Inc. in Boston. The vendors first an-nounced that they were codeveloping the product approximate-

1856 hosts: fault tolerance and a lower entry price, Herman said. The hardware component of Non-Stop Net/Master starts at 25,000, be added. The soft-ware ranges from about \$3,000 to \$100,000, depending on configuration, Berman said.

Equation, Iteranas max.

Better fitten before
Non-Stop Net/Master provides
Non-Stop Net/Master provides
Non-Stop Net/Master provides
Non-Stop Net/Master provides
Network of the Network of Network of

by two years ago.

While many users will balk at managing their IBM installations from a Tandem machine, Tandem's Non-Stop architecture of-

Also next week, Systems Center will add several new modules to its Solve series of network and system manage-ment applications, according to David Passmore, a vice presi-dent at Gartner Group, Inc. in Stamford, Conn. The new mod-ules are expected to include the following:

ules äre expected to include the following:

« Solver-Problem is said to identification of contain network problems.

« Solver-Canega en said to include in a Solver-Canega en said to transe the said to track and control deployment of reportors and to manage reports, changes and to consigurations, changes and to consigurations, changes and to consigurations. Solver-Canega it is said to baild bridges between standards-based and proprietary networks and network management systems. Solver-Canega McConsoft Corp., OSIQ-Passed focal-area network management package and pa

YOU CAN'T KEEP THE COMPETITION IN CHECK Unless You Anticipate Ali Their M



FOCUS FROM INFORMATION BUILDERS: Nothing Else Lets You Analyze And Utilize Mission Critical Information From Any Database On Any Platform.

IINMANAGEABLE BATA WILL NEVER BE INFORMATION

If only there was a way to work with different DBMS'. on different platforms, with a single set of software tools. A way to develop applications using all your data, no matter where it is, to run transparently on any platform. A way that avoids system bottlenecks and fully utilizes your information investment, so that mission critical never becomes mission impossible.

THERE IS A BETTER WAY

It's called FOCUS from Information Builders. The specialists in distributed information systems. And with more than one million users in every one of the Fortune 100, FOCUS is the number one 4GL. EXT has a Research Trainment of Information Resident Inc. 1250 Resident New York NY 19864

for end-user computing and application development.

DO ANYTHING WITH INFORMATION

POCUS is powerful enough to provide decision support features like business graphics, spreadsheets and the best report writer in the business. With an unmatched ability to control and integrate critical information systems within your enterprise, FOCUS lets departmental users maintain applications that meet their requirements

YOU WANT IT, FOCUS CAN CREATE IT

With comprehensive built-in tools you get the flexibility to develop anything from highly structured data management applications and decision support stems, to simple ad hoc queries and reports. With FOCUS, data becomes information, and isn't

that exactly what you've always wanted?

So let your competition make the wrong moves while you make the winning one. For more information on FOCUS and how it can fulfill all your data management needs or to attend a

FREE Seminar...

Call 1-800-969-INFO In Canada call 1-416-364-2760



If an image is worth a thousand words, imagine what imaging is worth to you.

Your strategic picture. Like the strategic pictures of businesses and governments around the world, it's what Unisys had in mind when we designed our Infolmage family of imaging solutions.

The benefits go beyond reductions in paperwork. Beyond protecting the integrity of originals. Even beyond savings from enhanced productivity. For Infolmage solutions not only help you process applications quicker, handle claims more efficiently, and respond to customers faster. They also help you create marketable, revenuegenerating new services.

Cold Thorp Corporation Spiritual in a Iradenius of Usings Corporation Whatever your business and whatever it's built on-checks or claims of correspondence or blueprints or signed authorizations-our imaging solutions enable you to capture documents electronically. You can move them throughout your enterprise, gain simultaneous access to them, and put them to work growing your fusioness.

As a leader in imaging, we know that truly advanced solutions do not



consist of technology for technology's sake. Beginning with a cardyl understanding of the customer's needs, we apply imaging technology fo reflect the unique flow of information within an organization. And our Infolmage Professional Services recognize that an imaging solution isn't a solution unless it's integrated into the' customer's existing systems.

Whether you're in finance, government, travel, telecommunications or any other service industry, call us at 1-800-448-1424, ext. 139. Ask how our imaging solutions can help improve your business picture today.

TI (finally) delivers souped-up SPARC

BY MARK HALPER

rry Hambly, Sun's vice president of eting, all but confirmed that the May ncement will entail Super-

System-performance ratings in Sun's orthcoming systems are therefore ex-sected to be below the range that would save pushed Sun closer to rivals such as

rocessors. The chap's superscalar design will not fully optimized, however, until soft-are firms recomple their programs to the chap's design of the chap's the highest naking members of the SPARC Internal prought and illustrate available to her companies in the second half of this are Rinkines said. The chap's are Rinkines said.

Rhines attributed the dilay to the coun xity of the device, which includes 3.1 lion transistors and functions typically idled by other board-level circuitry.

DEC reveals

FDDI switch



If you're trying to write busine solutions for UNIX, you know one thing for sure: The backlog can be backbreaking. So in the spirit of helpfulness, we or you the perfect answer.

Actually, we offer you two ways to

cheat. Which is twice as good. And both involve uniVerse by VMark. Through VMark Software, you have

access to approximately 4,000 proven,

industry expertise, for a broad range of vertical markets, including distribution, manufacturing, financial, government and health care. And uniVerse lets you run them on over suty platforms from wrtuafy every manufacturer in the world. So you can have the application you

went, when you need it, and on the platform you prefer. The second route to fast UNIX

uniVerse's second big attribute. It is, we believe, the easiest application development enworment in use today. And the applications you build will be able to take full advantage of all the benefits and freedom of choice that make UNIX and open systems so attractive. VMark, Think of us as business

solutions for UNIX. To go.

uniVerse by O F



Break Down the Barriers Between People and the Information They Need

The World's Leading Information Delivery System.

A lot of obstacles stand between your organization's two most important assets; people and the information the need to make better decisions. With the SAS System, you can deliver the right information to the right people at the right time. Every time. And you can break down all the barriers created by...

Diverse Data Sources

The SAS System turns your organization's "islands of information" into generalized resources available to any user or application—no matter where or how data are stored, from popular databases to remote external files.

Diverse Applications

The applications that drive your enterprise are fully integrated in the SAS System—everything from ElS and decision support to financial analysis and reporting to quality management. This comprehensive approach eliminates the need for single-shot software solutions that have made a nathwork outlif of your apolications strategy.

Diverse Client Needs

The specific needs and experience level of every client from new computer users to seasoned pros—are met through personalized interfaces. Take advantage of iconbased executive information systems, upint-and-click menus for business analysts, an object-oriented applications development environment, or a full-screen display environment just for programmers.

Diverse Computing Platforms

The SAS System maximizes the effective use of your entire computing mix—from PCs and workstations to minicomputers and maintenase. You'll have the hardware independence—without sacrificing your ability to exploit the particular advantages of specific nervinonents. Plus the ability to implement cooperative processing by segmenting applications any way you choose.

For your free video introduction to the SAS System, give your Software Sales Account Manager a callatoday at 919-677-8200. Also ask for details about the free SAS System Executive Briefing—coming soon in your area.



SAS Institute Inc. Software Sales Divisio

Cary, NC 27513

SAS is a registered trademark of SAS Institute Inc.
Convolete C 1997 by SAS Institute Inc. Printed in the U.



COMING SOON TO A SEMINAR NEAR YOU.

here's only one thing better than straightforward, accurate information:

And that's having it brought to you. Free. So that's what we're doing. With an ongoing series of systems management seminars held in more than 30

cities throughout North America and Europe. Some are executive-level briefings covering IS business

issues. Others provide nuts-and-

bolts solutions to the problems that IS professionals face daily. All are half- or one-day sessions filled with the kind of expert information that can have a significant impact on how you view systems management.

So far this year, more than 2,000 IS professionals have taken advantage of our free seminars. And since we're probably coming soon to a city nearby, you can too.

Without making a big production out of it.

The subjects we cover:

Data Center Automation • Resource Management • Network Management IS Financial Management • Automated Software Management • Automated Software Distribution

And some of the cities we tour:

US	Houston, TX
Albany, NY	Iselin, N
Boston, MA	King of Prussia, PA
Chicago, IL	Los Angeles, CA
Columbus, OH	Nashville, TN
Dallas, TX	New York, NY
Detroit, MI	Pasadena, CA
Hartford, CT	Philadelphia, PA

Phoenix, AZ ortland, OR igh, NC ian Francisco, CA Mexico City Montreal Munich

Call I-800-676-LGNT for more information:

If you're a systems management professional in a mainframe environment, call 1-800-676-LGNT

for seminar locations and dates. and for your free copy of Legent's "Rips the lid off" poster.



NCR to migrate monitor to other Unix platforms

BY ELLIS BOOKER

DAYTON, Ohio - NCR Corp.'s tions, will be ported to several non-NCR Unix platforms later this summer, the AT&T subsid-

form, said Independence execu-tives, who also plan to port the monitor to San Microsystems, Inc.'s SPARCserver, IBM's RISC System/6000 and Pyramid Technology Corp.'s MiServer but the third country

the news, saying it should broad-

of the year-next monitor, which until a has been available

ers (OLTP) was less the

are coming to beli can handle transact

XA, to communicate with XA

at the moment is Tuxedo, whis was developed by NCR pare AT&T in the mid-1980s. Tu edo is now owned and marketed by Unix System Laboratories. Inc. "There are 500 or so Tux edo licenses out there," said Ro

ies at Gartner Group, Inc. in nford, Conn nks Top End will gather am among large users beds of transacti

second," he said.

A third monitor from Pitta-burg-based Transarc Corp. be-gan shapping this month. Called Encina, it uses the Open Soft-ware Foundation's Distributed

dard.

Top End was designated as the strategic transaction moni-tor for the combined AT&T/ NCR when the two companies detailed their converged product line in June 1991.

HOW TO SELL USED 800-343-6474

MAY 11, 1992

THE RING LEADER IS ON A ROLL

First in token ring technology.

Madge Networks is widely recognized as the leader in token ring technology. Madge delivers the highest performance, reliability and compatibility across a broad range of token ring products. So when companies like Hewlett-Packard. SynOptics, Cisco.

Xirrom and ADC/Fibermux want to deliver token ring solutions

First in token ring support. Madge offers the only comprehensive installation

products and cabling system hubs.

card is not successfully installed.

forming source routing bridges, network management

and support guarantee in the industry, A tollfree hotline. On-site technical support. A five-year product warranty. And a money back guarantee if any Madge

to their customers, they turn to Madge First in token ring performance. In test after test, Madge consistently scores highest.

In the latest NSTL' study, Madge 16/4 adapters were first in performance, features and usability. Madge adapters significantly improve the performance of every workstation.

server and gateway in your network. We also deliver the industry's highest per-

First in token ring price/performance. Madde is rolling back its prices to deliver the industry's

top price/performance combination. Until Sentember 30. you can get the highest performing 16/4 token ring adapters, and save as much as \$8,000! Ask about our intropack II offer now.

Don't pass up this opportunity to Run with the Ring Leader.

THE RING I FADER

Madge Networks, Inc., 42 Airport Parlovay, San Jose, CA 95110 (404) 441-1300 Fax (404) 441-1335 "KSE, as integrated drawn of Design Brown to Evap. The import was published in the PC Large Evang Brown." Mater Bug Leader and Bugseds are made makes of Bulgs Schools, Lid. 32 of the Englanding Large.



Are you too busy fixing old applications to think about getting new technology off the ground?

Every day, more and more IS managers appreciate the tremendous opportunities offered by new technologies such as client/server, cooperative processing and graphical user interfaces. Meanwhile, the pressure to maintain existing systems never lets up.

KnowledgeWare understands your need to maintain current systems. Our Application Development Workbench* family now includes ADW/Pinpoint, Inspector and Recoder to help you understand, analyze and document existing applications. And a reengineering strategy that underlines our commitment to bring the focus and discipline of full-lifecycle CASE technology to redevelopment.

At the same time, KnowledgeWare continues to expand the scope of forward engineering. Our Construction Workstation-GUI brings the advantages of integrated CASE to the development of applications with graphical user interfaces operating in client/server and cooperative processing environments.

These new products demonstrate our progress toward helping you meet today's challenges. While allowing you to adopt technology that takes you into the future. And we offer the training, support and technology expertise to ensure your success. Call KnowledgeWare at 1-800-338-4130

for complete information on the CASE industry's most comprehensive reengineering and development strategy. Launch your company into the future of IS management.

KnowledgeWare*



AT&T Electronic Mail Services.

Connecting diverse "islands of automation" while still utilizing existing facilities and equipment is critical in today's highly competitive business environment.

With ATMT Electronic Mail Services, based on the X.400 standard, you can ensure effortless intracompany, intercompany and global communication, as well as conduct mission-critical applications such as point-of-sale data collection, dispatching field personnel, and price change notification, all of which can give your company a definite competitive edge.

ATAT Électronic Mail Services offers a total network solution that supports a range of environments, including desktops, LANs and mainframes. And with our access and delivery options, you can interact with all your trading partners in an efficient way.

How to improve your office connectivity by using

As a turnkey answer to your need for total system management and internal expertise, ATMT Electronic Mail Services is just one of the many electronic messaging solutions offered by ATMT EasyLink Services. Together they answer your global communication needs and help you see, bear and say things you never could before.

For more information on how AT&T Easylink Services-the worldwide leader in electronic mail services-can develop a mail service that is right for you, call your account representative or AT&T Easylink Services at 1800 242-6005, Dept. 6319.









The new HP Paint let XL300 lets you make a splash without getting soaked.

At last. A printer with fantastic color and a brilliantly low price. \$3,495.





CONTROL Pulses (impany "happened in his previous for an ellipse Practings are represed automate of white typeres, for an tell 5, and other countries. He Canada rad i flat are like East 25th PRACE.

Vivid color has never been so affordable. Hewlett-Packard introduces the PaintJet XL300 inkjet printer. Now you can add a 300 dpi color printer to your system for the remarkably low price of just \$3,495.

The Paint Let XL300 has HP Laser-Jet printer compatibility built right in. The same typefaces. The same page formatting. It also has PC/Macintosh auto-switching, so users in a mixed environment can share. And, just like a Laser-Jet, the Paint Let XL300 becomes network-ready with optional HP JetDirect interface cards.

Get laser-quality text and graphics

on a choice of media that includes plain paper and transparencies. Or add optional Adobe "PostScript" for access to even more graphics applications.

Now that there's a printer as practical as the PaintJet XL300, maybe it's time you took the plunge into color. Call 1-800-752-0900, Ext. 3159 for a free print sample and the name of the authorized HP dealer nearest you;





YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$38.95° per year — a savings of \$9.00 off the basic subscription price.

Address Shows: Differe Diffusions
*U.S. Only Connect \$74.97 Connect South;
In U.S. dollars.

COMPUTERWORLD



YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$38.95° per year — a savings of \$9.00 off the basic subscription price.

COMPUTERWORLD





E4219-9



BUSINESS REPLY MAIL FIRST CLASS MAIL PERMIT NO. 56 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044 Marion, Ohio 43306-4144







BUSINESS REPLY MAIL FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044 Marion, Ohio 43306-4144

ADVANCED TECHNOLOGY

TECH TALK

Five years out

Look out if you want to know where multimedia tech-nology can go. One recent study predicted that the mar-ket for business-oriented ultimedia will grow 18 mes, from \$500 million last ar to \$9 billion in 1997. ar to \$9 billion in 1997, wwm Ltd., a consulting firm used in London, sees multi-edia growth as being tied three key technology nases: customized systems, ackaged multimedia soft-are and advanced desktop mmunications. The rep id that by 1997, multim ia personal computers will ecount for 34% of the ined base of busin

Five years back

■ Literature about the 1987 Chernobyl nuclear accident is going on-line. The Pacific Northwest Division of Bat-telle Memorial Institute in Richland, Wash., has released Richland, Wash, has released a personal computer soft-ware package called Cherno-lit. The program contains more than 4,500 cited refer-ences and abstracts relating to the tragedy. It now runs on IBM PCs and compatibles and will be offered for the Ap-ple Computer, Inc. Macin-tosh in the future.

Learn by example

Belicore researchers in Morristown, N.J., said they have developed a neural net-

have developed a neural net-work computer that learns the way school children do — following simple example provided by an electronic teacher. Belloor researcher Josh Alspector said the ex-perimental computer can more than 100,000 individual signals per second — 10 housand times faster than is ossible with a high-speed workstation. The computer an learn to add two nun-zers and then generalize that mowiedge to solve other adition problems, he said. That apability, he added, could eat the core of computers. be at the core of computers that could solve complex problems faster than curren neural network machines.

The battle of the batteries begins

Possibilities are 'infinite' in making longer lasting batteries for portable computers

BY MICHAEL PITZGERALD

Discover someth possible with an

Stare here for 15 seconds.



ing never before \$890 terminal.

Now stare here.



Introducing the WY-325 <u>color</u> terminal for only \$890. (Yes, you can believe your eyes.) It is ergonomically advanced. It emulates general-purpose terminals such as DEC, ADDS, Helvideo and, who would have guesed, Wyse, And he WY-325 replaces a monochromatic terminal without making changes at the host computer or to the application. Although this list of benefits could go on, the price alone should color your thinking about terminals.

[18] The could will be price alone should color your thinking about terminals.

EDITORIAL

In-site insight

e've occasionally used this space to highlight new features in Computer-sorial. Today's issue marks the pa-mier run of New Product In-Site, a withly feature that will provide you with what trust is valuable information for evaluating

rust is vaname an electroday, we Product in Site goes far beyond anything previously to evaluate the technologies and lacts that vendors tout as their key offerings, we chosen a methodology that draws upon the ti unimpeachable and unbiased sources for evaluations — namely, beta-test sites and

incorporated these major sites into our Product Evaluation Council, which is described on page 89. This selection of users is critical to the success of evaluating complex technology, such as the technology, such as the product of the selection of the selection

Vectorospec trax ampro came, see a testal abortary or special on the confines of a testal abortary.

Anyone who understands corporate compains a testal abortary or a testal abortary and testal abortary and testal abortary and testal abortary with eight of the same technology to handle mostly complete the same technology to handle mostly complete the same technology to handle mostly complete the same testal abortary came testal abortar





LETTERS TO THE EDITOR

IBM challenges study on VAX, AS/400

y Technology Investment itrategies Corp. (TISC) in a tudy that was the basis of our article, "VAX line wins

cil (TPC) con

nguration and associated costs used by DEC in the TPC-A benchmark

Frame relay: Expect what you pay for

In response to your article "Firm discards public frame-enlay network," [CW, April 6], I feel compelled to comment on londuring Design Corp.'s expectations of frame-enlay service.

The major benefit of frame-relay is not its "highly tonted barting capability." In fact, the barting capability. In fact, the contraction of the compelled to the compelled of the

frame-relay service provider and user must control and accommo rughout ANSI recor

inroughout ANSI recom-mendations, there are repeated comments that user failure to live within committed informa-tion rates may result in discard-ed packets. Frame-relay service suppliers will attempt to deliver data in exoses of committed in-formation rates, but this is on a

Wang is a winner



White Paper

OBJECT TECHNOLOGY A KEY SOFTWARF TWO FNOLOGIS FOR THE TOURS



Introduction

Object technology is revolutionizing the face of computing. In terms of productivity and cost-effectiveness, its potential is staggering. At least one early implementation performed under favorable conditions resulted in a 14:1 ratio of productivity improvement.

As the emphasis changes from hardware to software, object technology — including object-oriented programming, object-oriented analysis and design, object-oriented database management systems and object-oriented application interoperability frameworks — is coming to the fore.

This trend is manifesting itself as a rapidly growing demand for object-oriented training and consulting. The demand is so strong that some training has are accusally doubling or even tripling their staffs to keep up. A recent spening survey conducted by I/DC reveals that almost half of 1,600 respondents are becoming involved with object-oriented technology despite the cost of implementing it.

The reuse of standard software building blocks is integral to object technology. Just as hardware is assembled from perteased components, which are repetitively to design and construct even larger assembles, software too can one rely on pie-existing clock through the use of object technology, For example, there are object-oriented programming languages with special libraries of resusble components especially for graphical user interfaces.

The primary benefits of object-oriented programming are improved reliability and enhanced programmer productivity. Other benefits include clarity and the opportunity to model applications in a more natural way. The hierarchical structure of object-oriented programming makes programs easier to design and understand.

Object technology is a powerful driving force behind the creation of less expensive, more productive software. Its place in the computing firmament is well-established and growing rapidly.



THIS IDC WHITE PAPER IS ABOUT A SOFTWARE METHODOLOGY THAT IS STEADILY MOVING INTO THE MAINSTREAM. IDC BELIEVES IT WILL BE ONE OF THE MOST FUNDAMENTAL SOFTWARE TECH-NOLOGIES OF THE 1990s. THE SUBJECT IS OBJECT

OBJECT-ORIENTED DATABASE MANAGEMENT SYS-TEMS AND OBJECT-ORIENT-

TECHNOLOGY, A TERM THAT ENCOMPASSES SUCH THINGS AS OBJECT-ORIENTED PROGRAMMING.

OBJECT TECHNOLOGY:

A KEY SOFTWARE OLUTION

THE '90s

ED ANALYSIS AND DESIGN ■ MICROPROCESSORS AND

THEIR UNDERLYING IN-TEGRATED CIRCUIT TECH-NOLOGIES CREATED A REV-EPIC

PROPORTIONS IN THE IN-TECHNOLOGY FOR FORMATION PROCESSING INDUSTRY DURING THE

> 1980s. THE ABILITY TO PRODUCE LOW COST.

HIGHLY RELIABLE HARDWARE, REPETITIVELY AND EFFICIENTLY, FUELED THE DRAMATIC RISE OF PER-SONAL COMPUTERS AND WORKSTATIONS. THE

PRODUCTION OF SOFTWARE, MEANWHILE, HAS NOT KEPT PACE. ■ THE DEVELOPMENT OF SOFT-WARE APPLICATIONS, IN TERMS OF COST AND QUALITY. HAS IMPROVED AT A BARRLY DISCERNA

ible rate. This is changing Hardware costs are a rapidly declining part of the overall cost of providing business solutions Attention is now focused on programming, application development and maintenance Ways are being sought to position software technology so that application solutions can be produced more rapidly, at less cost and with higher quality. The technology with the greatest use of achieving this is object-oriented programming (OOP) and related discies. This promise exists because object technology supports the reuse of standard software building blocks

It is appropriate to compare OOP with ware development Hardware is assembled from pretested components which are used repetitively to design and construct even larger assemblies, them-selves reusable. The quality of each level of design is insured by pretesting The ree assembly is insured by interface standards that focus on the behavior/functionality of each component at its interface These same concepts are being ex

tended to software and application devel opment through the use of object technology. Tools are beginning to appea that support object-oriented design and analysis. There are OOP languages, with special libraries of reusable components, especially for graphical user interfaces And there are obsect-oriented database rms. All of them are intended to de liver the promise of obsert

DRAMATIC SUCCESSES

Any IS professional who has been on the job for more than six months is skeroical of anyone suggesting that large potential benefits will accrue simply by embracing a new technology Wasn't that what Computer-Aided Software Engineering (CASE) sducts were supposed to do? And why should we accept the counter-intuitive idea that software is orniogous to hardward Some or anizations have begun collecting metrics evaluating new software technology. Electronic Data Systems Corp. (EDS) has

done this for object-oriented program-

EDS performed a carefully structured

study of OOP using Smalltalk and an obarct-priented database management system to replicate an existing manufactur ing application. The application, a maintenance management system, h recently been implemented using PL/1 and a relational database. The system enuneers from that project were still available and had kept sufficient records to

allow a comparison. They also acted as the "user surrogate" for the Smalltalk team, which was brought in from the out EDS took great pains to keep the skill level of the two teams comparable. The

Smalltalk team worked from the same 300-page functional specification used by the original PL/1 team. The study mea sured the implementation effort from de sign through test. The original test clans and test suites were used to insure that all functions were implemented. This was a study, so the resulting system was never deployed. However, there were dramatic results a 14-1 increase in design

and programming productivity was It is important to realize two things about these gains. First, there was no o ject-technology learning curve. The Smalltalk team was experienced. Second, the functional specification used had een derived using traditional decompo-

sition techniques, not object-orien analysis and design. Even in this carefully controlled context, these numbers seem too good to be true. They seem outra-The natural inclination is to as

that despite EDS's efforts, something biased the outcome. That is not the case. ad, we are witnessing the result of a paradigm shift. A paradigm is a way of viewing the world. Alan Kay, the developer of Smalltalk, is fond of savine that the ability to change one's point of view (paradigm) is worth 35 IQ points. An ex-ample would be learning to multiply Arabic numbers instead of Roman nur Proponents see OOP as a paradigm shift with similar benef

OBJECT TECHNOLOGY INTEREST RIS

In the past 16 months, the demand for training and consulting for object-orienttrating and consuming to ed analysis and design has gone from healthy to explosive Training firms are scrambling to double or triple the size of their staffs in order to keep up with the demand. This rapid rise in interest in ob ject technology is also reflected in recent DC spending surveys. In its most recent vey, IDC finds that almost half of the ents are becoming involved with object technology. Users were asked to characterize their use of object-or

Overall, 26.8% describe their ite's use of objectdatabases or languages as exploratory, and 21% as significant The highest projected use is at sites whose senior systems are IBM machines. There, 42% say their use is exploratory and 18% say it is significant. While this question is limited to languages and databases, it does reflect the rising level of interest that will also drive the related markets for tools, training and consulting

BIG PROJECTS, BIG SAVINGS

merly Philips Elek er AB of Sweden, is a leading developer of command and con trol systems for the Swedish defense services. The company



THE LAST REVOLUTION WAS FOR PEOPLE WHO USE SOFTWARE.
THIS ONE IS FOR THE PEOPLE WHO WRITE IT.

The graphical revolution made computers far easier to use, but infinitely more difficult to program. That's why the industry is so intent on object-oriented systems, where powerful applications are created in

a fraction of the time.

For most companies,
just the first effort is still
at least three years away.
But NeXT has a proven
system that works today.

The NAT ray designation are removed above at the institute of your days count new Scale.

The NeXTstep"environment is an objectoriented world right down to the system level, offering tools you've never had before.

offening tools you've never had before.

NeXTstep's Application Kit gives you the objects common to most programs, ready to use without any modification, it even includes objects for faxing, choosing fonts/colors and

interapplication communication-all with

standard dialogs.
With the Interface
Builder, you can use
the mouse not only to
place and resize your
objects, but to change
their attributes and
define interaction—all

without writing code. For even greater power, the NeXTstep object library is wide open. That is, you can customize any object's behavior through the use of subclassing or create new objects.

Because you can reuse objects, there's no need to reinvent the wheel with every new project. And to

update, you need only modify a single object.
With NeXT workstations, custom software is
both intuitive and consistent, offering stunning
graphics and access to all system services.

Further, it integrates seamlessly with other applications, custom and

Just call us at 1-BOO-TRY-NeXT to receive our video, NeXT vs. Sun: A World of Difference (now available for \$7.95). It's proof positive that the next resolution in the computer industry is far closer than you think. In fact, on one oldform, it's already begun.

also develops real-time systems for several international markets. Its FS 2000 software system is an embedded shipboard command, control and communications an-

It supports a wide range of neval platforms and is being implemented on five ships from five countries. The electronics systems must be on a par with the complexity of those on much larger ships while enabling a small crew to control the operations. The varied requirements of the individual ships call for a well-engineered, flexible software design and architecture For some projects, the ships must also be multi-configurable de pending on operational needs us requiring the software to be thly adaptable. The complete PS 2000 system contains appe tely 1.5 million lines of code

for each ship. The software for each sys tent comprises 150-600 programs. All this software creates an ideal environment for implementing object technology.

The OOD App

Early in development, NobelTech took an object-oriented design (OOD) ap proach to the architecture of the FS 2000 system. Later the firm used object-based uning to implement it. The imple mentation language chosen in 1986 was Ada. NobelTech selected an OOD apbroach because OOD enabled the design earn to model the overall shipboard system more accurately and to ensure an optimal level of modularity and flexibil-ty. OOD also supported NobelTech's long-term strategy of developing common, reusable software subsystems for Working with a team of consultants

from Rational Consultants of Santa Clara, Calif., the company developed a method-ology that focused on the prototyping of software designs and an incremental inte-gration of software subsystems. This cus enabled the development team to emphasize system-level design considera as and to detect architectural flaws early in the development process. Its ap-proach also promoted a rapid maturation of critical interfaces throughout the soft-



The primary benefits of object-oriented programming are improved reliability and enhanced programmer pro-ductivity. Reliability is improved because each object is a "black box" to the external agents with which it communicates. The internal data structures and methods can be refined without impacting other sections of code. Traditional programs, in contrast, sometis hibit unanticipated side effects when a remote section of code is changed. The enents in which software must run have become exceedingly complex. There are graphical user interfaces, dynamic data interchanges

and remote database accesses. OOP is a way for programmers to cope with this

Programmer productivity is enhanced because classes of objects are reusable, i.e., each subclass or instance of an ob-ject can use the program code (methods) for the class. Programmer produc also enhanced by the more natural corre spondence of program objects to the ob-jects in the domain of the business appli-cation under development. Once the paradigm has been learned, application development is shortened, application developers can bring their products to

market sooner and 15 professionals can respond more quickly to user demands. Other benefits are clarity and the opportunity to model applications in a more natural way. Because data and programs are stored together, object-oriented pro-grams are easier to understand. The hierarchical structure of object-oriented promming is a natural way to represent ny objects in the real world beca successive layers present increasing levels of detail. This makes programs easier to design. It also makes programs easier to understand; a bonus for persons who

ES TO PLAN FOR

The major shortcoming of OOP is pur-ported to be performance relative to tra-



ered, with systems two through five in development. Software productivity the first system was more than twice that of NobelTech's historical average. More importantly, NobelTech's subse uent projections show that produ

should improve by more than 600% for the remaining shipboard installations Most of this improvement results from the high degree of software reuse att nearly 70% Historically. NobelTech had consumed

about 40% of its development in the inte-gration phase of projects. By using OOD, and increasing its efforts in the design phase, NobelTech reduced the time required for integration by more than half This reduction in integration time trans-lates directly into additional cost savings and quality improvement, because of the lower cost and reduced impact of finding and fixing errors earlier in the develop-

ment process

In attributing the cost savings for this project, NobelTech considered reuse, OOD and Rational products. Assuming reasonably that up to half of the reuse gains come from OOD/OOP (the other half coming from good architecture and good programming), the use OOD/OOP has the potential to save this project between \$59.9 million and \$77.8

tillion during its seven-year life. or to a lack of photogra-mirant, this page did no

First Rule of the Game: Stay Informed

Schoolike in the Object Illumparamet Group's Internetily servatives, IRST CASS and:

- Image on the Cil Indian's serve, events and intelling apportunities.

- Image on the Cil Indian's serve, events and intelling apportunities.

- Image of the Cil Indian's serve of the Cil Indian's Schoolike College of Indiances and Cill Indiances of the Cill Indiances of Indiances of the Cill Indiances of In

YESI I would be get into the game.
I understand that if FRIST CLASS doesn't receit my expectations, I can discard the invoice and issup my capy of no charge

Send me a two year subscription to FRST CLASS for S64 - a savings of 20%. International subscribers pay only S80.

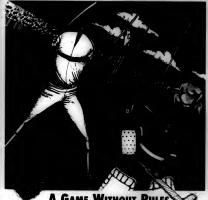
□ Sand toe a one year subscription to FRST CLASS for S40. International subscribes pay only S50. Prices include slapping and herefing. □ Bill me later □ Check exclased



Place Stamp Here

OBJECT MANAGEMENT GROUP, INC ATTN: FIRST CLASS 4730 EAST WALNUT STE 206 BOULDER CO 80301

USA



A GAME WITHOUT RULES IS HARD TO WIN

And the game of information technology is no exception.

In the pest, standalore systems made good competitive sense. But in today's global market, it's to whom you cannot, not whom you exclude that will determine the

That's where the Object Management Group (CMG) comes in. With your help, we're shaping the rules for a new information technology. Bules that support information sharing on on enterprise basis, failes that present the concept of once orbitaches and descharable late.

apabilities. Working hand in hand with over 200 hooling software technology providers and users, DMG is halping establish

or you am your organization integer or me game—catego at our in terr rate.

Cell 1+508-826-9300 today for more information about our non-profit organization. Or write as at
97 Old Concentrate Buth Empiricalisms MA 101701 HEA.



Key Concepts of Object-Oriented Programming

"In object-oriented analysis and design, the primary emphasis is on classes and objects, in contrast to structured analysis and design, where the primary emphasis is on process-oriented functional decomposition. In object-oriented analysis, the emphasis is on data."

ditional third-generation languages. Similar concerns are expressed when comparing the performance of object-oriented database management systems (ODBMS) with specialized file systems. In the EDS example mentioned above, a responsetime test showed that the Smalltalk implementation was twice as slow (30 vs 15 seconds), as the existing application. Performance is degraded by the dynamic binding of methods

to the data structures at run time.

Some object-oriented languages, e.g., C++, do support compilation, which improves performance at the expense of flexibility and ease of maimece. The database concerns are analogous to those in the early years of relational databases when horsechical databases were known to perform better The performance of ODBMSs has improved markedly in the ast two years, and will continue to im-

Productivity gains from program mod-ularity and reusability can be difficult to achieve. Programmers, faced with a large complex system, can be challenged to find the appropriate objects and to select the proper method or to identify the opti-mum method. Smalltalk, for example, in-cludes 5,000 methods in its programming nt. Tools are needed to help programmers make these choices. There is also a steep learning curve for tradi-tional programmers. The lack of any stan-dard object-oriented development rthodology is also a problem.

MULTIPLE FORMS OF OBJECT TECHNOLOGY

Object technology is not just OOP. There are several areas where object technology is making its presence felt. The major ones are . Object-oriented analysis and design (OOAD)

 Object-oriented programming and development environments Object-ories

 Object-based application interoperability ty frameworks.

There are many who feel that object-

oriented programming is going to displace structured analysis and des prace structured analysis and design. Some feel it will negate the need for analysis and design altogether because developers will prototype their applica-tions, drawing upon a rich set of class li-bearies. Unfortunately, both views are

mismided The point of analysis and desig whether structured or object-oriented, is to deal with complexity by applying principles like decomposition and abs in a methodical way. There are el

of the traditional structured methods, such as entity-relationship diagrams and data flow diagrams, that can contribute to object-oriented analysis and design. Many methodologists agree that there

are three basic aspects of a software de-sign: data, process and control. Data is the information content of the system, what is being processed and stored. Process is the algorithms, rules and ope tions performed on the data. Control tions performed on the data. Control is the determination of when or under what conditions the processes are performed. In object-oriented analysis the empha-sis is on data. Sally Shlaer and Stephen Mellor have summarized the different ori-

Four major methodologies for OOAD

 Shlaer and Mellor: Object-Oriented Analysis, Object-Oriented Design Lanuage, Recursive Design
Coad and Yourdon: Object-Oriented

Analysis

Rambaugh. et. al. (GE): Object Modeling Techniques

Booch: Object-Oriented Design.

These are worth serious conside These are worth senious consideration because their proponents have written books that explain the methodology, and there is consulting and training available from the authors or from third purities. An additional reason is that there is at least additional reason is that there is at least one CASE tool available to support each methodology. There are also other significant methodologies. Objectory from Objective Systems of Sweden supports Ja-cobson's methodology, Interactive Devel-opment Environments of San Francisco is

pomeers Environments of sain Praincisco is roomoting an object-oriented, structured design methodology developed by its president, Tony Wasserman. Similarly, Paradigm Plus from Hous-on-based Protonoff supports the Lekkos methodology. We will see this area con-trient to environ semestics. rhodology. We will see this area con-use to evolve, especially as some of the ore traditional CASE companies like lowledgeWare shift into this part of the triket. James Martin is known to be arking on business-oriented approaches

The Leader in Object-



Professional C programmers are choosing object-oriented C++ because they know it increases productive. And the C++ they're choosing is from Borland. With more than 500,000 copies of C++ shipped, Borland sets

......



ader in Object-Oriented

Beriand C++ 3.0. Evy year. The year development environment. Now you crush, edit, complete and row Western Street, edit, complete and row Western Street, edit or settled Windows All resulting its remarkable production. and C++ programment for Western and

DOS application development. The third-generation C++ compiler fully supports the AT&T CFIONT 30 standard C++ including templates! And the powerful C compiler fully implements the ANSI C standard. With both compilers included you can program in C today and move to C++

and C++

for Windows and DOS all

in one package!

Driented Progra

BYTE

from C to C++ easy!

To make your transition from C in C++ as smooth as possible, we've created two con-plete video training packages. And now with your order, you can get one FREE (retail value 490 85)!

If you're serious about moving to C++, go with the leader. Borland: Call now.

1-800-331-0877

neitive, ready-made user interfaces for indoors and DOS. Simply plug an applica-in framework into your application or cus-neities it any way you wide. High-level jects are ready to boll on with just a few jects are ready to boll on with just a few see of code. Add an eclator in just one linel internationally inherit windows, dialogs, must coally inherit windows, dialogs,

LDPOWER L Borland
L WordPerfect
Lotus
Microsoft
Claris
Addus

ObjectWindows also features Borland
Custom Casteoic that make your applications look great. Also included its Tarbo Vision," the
application framework for DOS that gives
you capabilities similar to ObjectWindows
for character-based programs. Both come with
full source code.

Windows developers are now talking about just one best development platform for Windows— Borland C++." -InfoWorld, Oct. 7, 1981

YES! Send we Revised C++ or Revised C++ & Applicat my free value training package. Buth my order to

ORLAND

CASE TOOLS SUPPORTING COAD ols that support OOAD are part of the larger set of tools referred to as "upper CASE" tools. All upper CASE tools provide support for diagramming in one or more methodologies. This means they allow an analyst or designer to draw the

diagrams and enter the descriptions ac-cording to the definition of the method. This is not enough, so beware of these tools. The tools must also implement the various rules and evaluation criteria to perform design checking and insure the method is being properly followed. Further, the tool should allow the designer to naturally follow the step-by-step pro-cess of the method. Most of these tools have some sort of repository associated with them. Only a few were developed Their repositories are structured with the idea of storing the object-oriented design in a canonical form appropriate to the

When this is the case, the tool can often support more than one OOAD method, storing the essence and details of the design in its repository and dis playing it more than one way. A tool with this capability generally lends itself to customization. Another important as-pect of the tools is whether (and how)

the repository THE MARKET FOR COAD TOOLS The market for OOAD tools is sn

when compared with the overall market for CASE tools. IDC believes that the OOAD tool market will remain relatively small, but will grow at a faster rate until 1996 when it will asse 96 when it will assume a growth rate wilst to the overall CASE market. Unix workstations are and will be the

dominant platform in this market. While Ada has played a role in this market, it is diminishing quickly as C++ takes over. Both tool and training vendors report that C++ is the language of choice for more than 90% of their clients other tool vendor can interface its tool, Several of the tool vendors are seeke.g., a project management package, to

ing alliances with either workstation ven-does or very large consulting companies. This is a common strategy designed to circumvent the problems that small com-panies often have when they try to support client bases that are scattered over wide geographical areas. One Swedish vendor, Objective Systems, can be expected to enter the U.S. market in 1992 sine this stratees

There are more than 80 object-oriented languages. Of these, less than a quarter are commercial products; the rest are research vehicles or associated with uni-versity projects. All 80 are based on one of four categories. Smalltalk, Pascal, C or

Since the 1970s, object-oriented capa bilities have been added to Lisp, Pascal, and C. Flavors, LOOPS and CLOS (Com-mon Lisp Object System), have object-oriented enhancements for Lisp. CLOS is

being proposed as an ANSI standard. Smalltalk has the reputation of being the purest object-oriented language and contains many concepts derived from earlier work performed in the development of languages like Simula. C++ is an exten-sion of C, and is referred to as a hybrid object-oriented language. There are simi-lar extensions of Lisp and COBOL in the

planning stages.

C++, developed at Bell Lahs and mar C++, developed at Bell Ialis and mar-keed by AT&T in Morristown, N.J., is rapidly emerging as a de facto standard for object-oriented C. Its nearest compesi-tor is Stepstone, Corp., Sandy Hook, .Conn., with its Objective C. The NeXT computer includes Objective C in its programming environment, and IBM has

purchased rights to market it. Digital Equipment Corp. has its own bject-oriented language, Trellis. Two

When the Object of Development is Deployment, GemStone and GeODE are the Answer.

In addition to setting the standard for stability and reliability, Servio leads the way in transparent deployment and portability across beterogeneous platforms and networks.

Now, with the introduction of the GenSione Object Development Environment, GeODE, Servio also sets the standard for object database development environments. GeODE

provides a complete forms package and the first code-free visual programming environment Combining the power of GeODE with

> GenStone's active object manipulation language and multiple language interfaces, Servio's products are without peer in case of development, deployment and

maintenance of object database





950 Marina Village Parkway, Suite 110 Alameda, CA 94591 (900) 243,9340 Complete 1970, Service Committee

Complete is a registered tentiment of Berris Committee

CoCOS is a trademark of Berris Committee

iges with minor market shares are Actor from the Whitewater Group, Evansion, Ill., and Effel from Interact Software Engineering, Goleta, Calif Each is unique and propnetary. Ada is sometimes considered an object-oriented lan guage because its packages resemble ob rcts. However, Ada does not support inheritance or dynamic banding

C++ VS. SMALLTALK

Two languages appear to be the merging winners in the marketplace. These are Smalltalk and C++ Some companies like Digitalk (Smalltalk V) and Interactive Development Environments (C++), support just one object-oriented sage. Others like Parc Place support

An IDC user survey reenforces this view. C++ and Smalltalk are the two dominant object-oriented languages at Fortune 500 sites and with vendors who develop software products. The same IDC survey shows that COBOL conti to dominate the programming activities of programmers in commercial operations.

4GL or CASE product. The relevant ques tion here is, among those interested in object-oriented programming, why is C++
proferred over Smalltalk?

Based on its research, IDC believer the strong support for C++ is concentrated in the community of programmers who develop software products, are involved with more complex, technical applications, are in the advanced technology groups of the Fortune 500, or develor

tools and utilities for the internal use of cial information processing operations It is these groups that consti the C user community, and it is the C user community that is generating most of the demand for C++.

These programmers regard C++ as a better C, or in some cases, just as the next revision of C. Having already embraced C, they are far more likely to adopt the hybrid C++ language than to convert to a significantly different language like Smalltalk. The C++ extensions to C are relatively small. That is, well over 90% of C++ is C. With these of

its use far exceeds any other language, sions, C++ becomes an enhanced C. Stronger type checking is the most common enhancement

IDC believes that it is still unclear which object-oriented language will be the dominant choice of the average MIS professional, who today finds C very unfriendly. Will Smalltalk enjoy some suc cess in this group, or will an object-ori

ed extension to Cobol prolong its popularity? It is too early to tell. It is cer tainly not too early to tell that other important trends, such as increases in client/server applications will affect the

One thing that can clarify this is the object-oriented application development environment. These products attempt to provide a level of golation between the developer and the underlying programming environment. One example is Intellicorp's ProKappa product, which provides an enviro enment and libraries for object-oriented programming in tradition

al C and G++. A more specialized exam-ple is Gain Technology's object-oriented mework that supports visual authoring for developing hypermedia appl rent example is Bos land's attempt with ObjectVision to reduce the effort encountered when trying to program database applications for Windows 3.0 by shielding programmers from some of the nitty-gritty details that

can make their tasks more complicated As application development environ ments evolve, especially to the extent that they provide higher degrees of 'visu-al programming' support, some aspects of al programming' support, some aspects of application development will become more dispersed from the centralized MIS organization and into the functional line organizations The object paradigm will facilitate this shift. The MIS organization will have a core of object-oriented (probably C++) programmers who will both acqu create and manage the libraries of objects methods and other reusable components that will be relevant to the enterprise. The systems analysts in the line functions will assemble these, using the visual programming user interfaces of the application de velopment environment to create the ap-plications needed to run the business. Business modeling and business pro-

cess modeling will play a role. CASE tools and analysis and design methods can be ected to evolve toward supporting various aspects of business process redesign.



OBJECT DATABASE MANAGEMENT SYSTEMS

To be useful for real-world applications, objects must continue to exist after the program run has been completed. This is referred to as persistence. In some applications this is done with prog file systems. More recently, object-oriented database management systems have become a viable alternative. ODBMSs are

needed to provide permanent storage for objects. Their data model has objects with the same characteristics as objects in object-oriented programming. Only here the objects are persistent ODBMSs are also needed for other

reasons, including handling complex data structures and abstract data types, and to support long duration transactions. ODBMS vendors must, therefore, provide both the capabilities of traditional DBMSs, e.g., back-up and recovery, transaction management, security and performance, but also support object ori-entation, e.g., object identity, encapsula-

tion, types or classes, and inheritance. IDC estimates that the market for ODBMSs was \$13.7 million in 1991.

This market will grow to \$146 million by 19%. Applications in the manufacturing industry account for the largest industry segment. Workstations are and will continue to be the platform of choice by a very wide margin.

VENDORS AND PRODUCTS The market for ODBMSs is emerging rapidly. ODBMS vendors are developing application development tools, porting to new hardware platforms, building interfaces to existing software environand enhancing database performance and

es with existing or Venc announced ODBMSs include Innovative Systems Techniques, Itasca, Persistent Data Systems, O2, Objectivity, Object Databases, Object Design, Ontos, Servio Logic Corporation, Symbolics, and Versant, as well as such major hardware vendors as Hewlett-Packard.

ODBMSs and relational DBMSs can traditional data; the object-oriented each be enhanced with the other technology. The relational model is suited for types. At least one worder, UniSQL, of Austin, Texas, offers a process

out that combines support for both object and relational data models. Since traditional data is only a minority of the tion in organ ere is a very large a stential for ODBMSs.

Object-oriented concepts an be applied at many dif-erent levels. At one end of the spectrum is the idea that whole programs, even whole pplications, can be treated applications, can be treated like objects. By this we mean they can be treated as a form of encapsulation in which a set of operations is defined for the program. The pro-

gram then becomes a server object, which will respond to

Only NCR Is Putt



ing It All Together.

Open, Cooperative Computing Offers The World's Most Complete Open Computing Solutions.

NCR has emerged as the leading supplier of a new way of computing. Offering performance enhancements and cost efficiencies superior by an order of magnitude to conventional mainframe-centered solutions. Designed to help your organization respond quickly to the challenges and opportunities of increasingly competitive world markets

No one is delivering more com-

plete, and powerful, open systems solutions. A new generation of mobile computers with advanced networking built in. Pen-based systems.

A full line of personal computers. Massively-parallel enterprise servers far Surpassing traditional mainframes in power NCR COOPERATION®-an innovative suite of enterprise integration software designed to help you re-engineer your business processes for greater efficiency. And the world's most comprehensive set of networking and



And that's just for starters. Our access to the worldmous R&D facilities of ARET Bell Labs and the advanced

parallel-processing technology of our Teradata organization will ensure that we maintain the lead in open enterprise computing solutions. We have the people, the products, and



For a free brochure-"How To Build Truly Open, Enterprise-Wide



Open, Cooperative Computing. The Strategy For Managing Change.

ANNOUNCING OBJECT WORLD CONFERENCE AND EXPOSITION.

It's For Both Types Of People In The World.



THOSE INTERESTED IN THE TECHNOLOGY OF OBJECTS.

Are you a bands on technical professional who's convisced that object technology (01) is the best way to increase productivity and improve th quality at applications and programs?

and applications? And who's committed to bringing object tech your company?

Either way, Object World is fo

It's the only event to focus on both the technical and business espects of parting objects to work. And it brings together users and vendors of objetechnology for four intention days of exhibits, sensions, and conference sensions divided into two superate tracks: The Technology of Objects and The Business of Objects.

Object World is a no-nonsense gathering for people and companies who are exploring the potential of object technology or putting it to work

You'll meet one-on-one with those who are successfully using (I) to solve and world problems — in menufacturing, financial services, tolocon-meniatories, defense, CAD/CAD, CAS, and more. Plac, you'll have the chance to wide some of eachbeing companies and see

Object World is sponsored by the Object Management Group (OMG), on intermedional organization dedicated in premissing the theory and practice of object-oriented to nalogy in software development.



AND THOSE INTERESTED IN THE BUSINESS OF OBJECTS.

So don't mice out on this opportunity, for more detailed information and special offers, places complete this coupon and mail it be. Object World, ch World Expo Corp., 70. Bast 1907, Framiniphore, MA 07/01-1907, Or call us at 1-800-225-4690 or 508-879-4700. Can't wait? Fast it to us at 504-87-2637.

If you prefer you can also sand E-Mail to: ang — server @ ang.org
Type the word "help" on a line by itself for instructions, and "index" for
modelable files

Come to Object World '92, June 20-23, in Sen Francisco. It's the only event for both types of people in the world.

And get on our mailing list for Object World '93, June 14-12,	
Francisco.	
Morse seed my FIEE Exhibits Only ticket.	
Please seed me FREE confurence information.	
Morse seed see information on exhibiting at Object World.	

Min Company Co

à récede unic a dissale biolog

may be a client object, sending a message to another object. This approach allows a gentle transition of existing non-object-oriented, programs into an object-oriented environment. This is particularly poweful if the environment is distributed across a collection of heterogeneous platforms.

evogenous platform.

There is no standard name for this type of environment yet, so IDC calls it an object-oriented application interoperability and object-oriented application interoperability of the object management of object management system. The ceren's service is called the Object Request Broker (ORB). The ORB is at the core of this service is called the OBject Request Broker (ORB) and the core of the object of

plication object, or server, requesting Assone action, e.g., a service of some kind. cr.
The ORM fields the request and performs there functions transparently:

as finds the object that will perform the service

because the service of the service

ing object that performs the requested operation.

The Object Management Group, discussed below, has been a catalysi in authorizing control of the control o

An example is Digital Equipment's
An Asservices The ACA Services are Network Application Support (NAS) software
products that provide facilities for integrating independently developed applicacitors and services across a networked,
mixed-platform computing environment.

iceings of up to 20% over traditional integration techniques may be realized using DEC's ACA Services.

8 ACA Services can be used in many appliL cation domains, such as CASE, CIM. 97tems integration, electronic publishing and office automation. Andersen Consultation (in greecestly conducted a study that found that it is reasonable for systems unergars was

and office automation. Andersen Consuling recently conducted a study that found that it is reasonable for systems integrations to expect potential savings of approximately 20% over machinal integration techniques using ACA Services for new system development. Savings of at least 50% can be expected in reengineering systems.

OBJECT MANAGEMENT GROUP OMG was formed in 1989 by a small

OMC was formed in 1990 by a small group of versions and user organization group of versions and user organization group of versions and user organization grows and the post of the post and post of the post of t

When making the transition to object technology, it is vise to do so in a deliberate, evolutionary fashion and awareness that there is a steep learning curve. There are several initial steps to make.

* Secure a financial commitment from top maniment from top maniment from top maniment.

GETTING STARTED

agement. Top management should realize that savings will occur in subsequent project.

In order to gain acceptance, pick a new project, not a puritally completed one. If applications are being downsized or moved to a client/server environment, developes will be more open to ob-

 Use external training and consulting organizatransition to object technolo-

tions for the transmon to doject echnology.

Address the shift in skills mix that must accompany the corresponding shift of activities toward the front end of the software development life cycle.

ware development life cycle.

• Pay amention to administrative issues,
i.e. managing class libraries. Consultants
can help here.

• Encourage systems analysts to use object-oriented analysis and design methods

- consultants on modeling their busi-

nesses.

• Reward programmers for creating and using reusable code.

CONCLUSION

Object technology is still evolving, but it is mature enough to put into production. It is mature enough to put into production in impact that been broadly fet in the industry. There is a rich array of the industry. There is a rich array of the industry. There is a rich array of the industry. There is a rich array to be industry. There is a rich array to be industry in the industry. In the industry is a rich industry in the in

Due to a lack of photographic contract, this page did not reproduce well. While our competitors talk about getting here.



At SunSoft, we're there.

Why wait for some set-to-be-delivered UNIX® knock-off where networking is an afforthought? New Technology is shapping today. It has a name: Solaris. The industry's only shreek-wrapped distributed



The Killer Environment
The 1990s as the decide of the lifter application. The 1990s is
the decide of the lifter application. The 1990s is
the decide of the lifter restorates. Solars, Baston Santol, the
most widely used 20-bit operating system; it will incorporate (NIX
SWH and add symmetric multiprocessing and multithreading to
the decige mission of entitle publication, solar facility for interest ordering missions or entitles used with Santon (NIX)**, the
network is the computer Moor than one million were experience.

The contraction of the computer Moor than one million were experience. ed the power of consecting to any computer-IBM, Apple, DEC, HP

But Solaris down 1 step force. It integrates the erbost OpenWindows** development patients. Empowering developes to cruse transmiss*, and destributed applications for Almering applications to many-openits—affected free are in the efficience of according or across the contents. Our process in their frames have for terms or your target. Solation temporar an extraordinarily proceed framework for temporary and according to the process of the according to the process of the efficiency of the according to the failure of Opinion Devyment is grain the process of the according to the failure of computing, with Almerin and Content of the according to the failure of computing, with Almerin and Content of the according to the failure of the according to the according to the according to the pages.

So entry, 10 cmm*9 los URELX.

Solaris 33-M: Vistual memory. Nultitasking, Mahlmendor
connectives, Application interspectables, Adding this year NEA,
systematic multiprocuning, multithreading and distributed objects.
Imagine this power uniting the world's most popular SPAIC and
SSASS comparts or 1952. Imagine being also to accome similarity.

Imagine no more, Solaris pata all network resources at your frager graphically through the 50 OPEN LOOK® desirate metaphox Magnified Hop—on-lare content-ensable hyperical documentation——as a year personal state wide Solaris adults Desick®², a suite of 15 workgroup productivity applications includ Multimeda. Mad his integrated were and video capabilities and Bortgroup Calendar which look groups and a desirable across the

What's more, Solare has all your favorite applications, Lotus 1-2-3, Action-Tate diluxe, WordPerfect, More compatible solutions than any other 32-bit environment. More than 3600 in all.



To got thore, where hore.

Ale of comparise talk shout enabling distributed computing reality.

Still more only dream about it. But at Statistic, we've made it happen.

So I've want to here where distributed computing is going in the Still, talk to some other manufacturers. But if you want to see where it is,



Multimedia gets down to business



kt. De business of to seem at the s of gaining

GAINM

cavirament. It is the only application development solution that merges multimedia with the business of your information systems. By giving your developers a sensor rich, code-free application architecture. By letting neoale-

and a physications share and reuse multimedia data objeing supporting thousands of concurrent neers across yeentire enterprise. By giving your users instant access to terabyte-sized databases. And by making it easy to be easy to learn, and easy to use complex information sys-

> inMomentum is available now. Call us at (800) 232-GA 'Il show you how GainMomentum can help you put

Cain Technology, Inc. 1870 Embarcadero Rd.

FBI endangering privacy for all



DEC helps dig grave for workstation standard



It's Been Open For Years. It Operates 24 Hours A Day. It's A Lot Like Our Computers.

There are few things in this life more dependable than a computer from Sequoia Systems.

In fact, only Sequoia always gives you the flexibility of open systems and the reliability of fault tolerance in the same package. It's a package ideally suited to high-performance on-line transaction processing.

Sequoia's open system allows you to take advantage of the latest technologies, and makes it easier for you to operate successfully in a multi-vendor environment.

Our unique method of achieving fault tolerance ensures constant availability to your on-line business applications, plus integrity of your data. And it also provides on-line service, with constant monitoring that can actually anticipate and prevent system downtime. architecture gives you the high performance necessary to handle complex OLTP applications, and to support a large number of simultaneous users.

Then as your number of users grows, your Sequoia system grows right with them – all the way to several thousand stations. This growth is modular, so you only purchase what you need, when you need it. And this expansion always happens while you're on-line.

Now, if you think all this sounds expensive, bear in mind that Sequoia shares another characteristic with the classic diner; our products are always an excellent value.

For a copy of our latest audited performance benchmark report, call 1-800-562-0011 (in MA 800-245-4033).

Contact us today. Because when you hear what we have

to say, we think you'll eat it up.

A symmetrical multi-processor

(SEQUOIA)

Open Systems, Continuous Availability.

© 1991 Sezzou Systems, Inc., 400 Neckerson Road, Murillocoards, MA 01752, Sezzou n.a memored trademark of Systems Inc.

DESKTOP COMPUTING

PCs AND SOFTWARE . WORKSTATIONS

SPSS powers desktop tools

SPSS for Windows packages analytical engine with graphical interface

BY CHRISTOPHER LINDQUIST

product.

laphtali said she has been usSPSS' products since 1975

analysis work. She was parlarly impressed with the way



McKesson Drug curing inaccuracy of warehouse labor with wearable PCs

BY JAMES DALY

SAN FRANCISCO - First,

XDB: DB2 Development on the PC.



It Saves

It Works

It's Proven

Compaq slashes portable line prices

with an integrated to Advanced Micro Devices, Inc.'s 33-MHz 3865X. It will include Novell, Inc.'s DR DOS, offer IBM Video Graphics Array

in Compact Computer Corp., recently out prices on and expanded the high end of its portable fine by natroducing the 7468 hagaits.

The 1486 hagait

to stay competitive in to wered luggable market.

a Lotus Development Corp. began shipping an up-graded version of its 1-2-3 for Unix System V. The latest 1-2-3 comes with improvements in data access, operating system compatibility and perspheral support, according to company

a Seagate Technology, Inc. announced it would ship many of its hard drives with preloaded Microsoft Corp. Windows 3.1 software.

Windows help on CD-ROM

With more than 10 million Windows users worldwide, getting through to Mccrosoft Corp.'s through to Mccrosoft Corp.'s through to Mccrosoft Corp.'s So San Jose, Cald-hased Mrider, Inc. has decided to cut out the middleman, Mccrosoft, by manifon on compact discreased colored to the middleman, Mccrosoft, by Mccrosoft, by Mccrosoft, by Mccrosoft, by Mccrosoft, by Mccrosoft, by Mccrosoft Corp. McM.

Helpding for Windows is an indexed CD-8/MM that is updated to make the middle of the McCrosoft Corp. McCrosoft Co

ware packages that run on Wir

dows.

'In particular, Helpdisq assists users who are moving from Windows 3.0 to 3.1 to maintain application compatibility. Currently, more than 200 vendors have supplied information to M'aider for use in Helpdisq is slated for availability later this month for an annual subscription price of \$1.495. The base price provides 12 monthly issues for use on one workstation or by as many as

workstation or by as many as

three local-area network users.
A site license is available for approximately \$3,900. Windows 3.0 or 3.1 and a CD-ROM reader

compatibility. The for \$1,300.

m Lotus Development Corp.'s CC:Mail Division ex-panded its support of the IBM world earlier this month by an-nouncing plans to resell IBM

Systems Network Architecture Distribution Services (SNADS) to CC:Mail gateway, which is marketed by LinkAge, Inc. The gateway will allow a di-trict connection has

The gateway was above a correct connection between CC:Mail and SNADS-compliant systems, including such IBM of fice host platforms as Office Vision/400 and Office Vision/MV:

s Peachtree Software plans

to use Lotus' SmarText 2.0 for Windows to provide on-line ref-erence tools in its next release of its accounting soft ware. Smar-Text is a hypertext tool for build-ing and reading on-line docu-mentation.

mentation.

Peachtree will provide such reference tools as The Accounting Primer, Glossary and Tutorial in Peachtree Accounting for



Curing inaccuracy of warehouse labor

STOCK-ROOM for the neighborhood phar-

JIM COHUNE MCKESSON DRUG



Or HOW ARET SYSTIMAX PDS Gives More Promise To Your Premises.

ATRE SYSTIMAX* Premises Distribution System gives you the capability to access voice, data, video, Any kind of information. Anywhere in your building. Through a single comprehensive building wiring system. TRRF SYSTEMAX PDS is a completely modular system that combines bardware, copper wire, connectors, and fiber optics; with the only five year product warranty in the business. ATRE SYSTIMAX PDS enables information to travel from building to building. Office to office. Floor to floor. Platform to platform. Regardless Office to other. From to more readours to plant this eggs areas of differences in operating systems. Or networking protocols. A truly open architecture. For real multivendor compatibility. With AIRT SYSTMAN (1905, as your business grows, you wayster grows, too. And that Ro give any business more promise. Call AIRT Network Systems at 1 800 344-0223, ext. 1026 to see how it can work for you. Outside the U.S. call. 602 233-5855.

ADAT Network Systems And Bell Laboratories. Technologies For The Real World.



COMMENTARY Michael Fitzgerald

Here comes 2.88M bytes

IBM'a new Per-sonal System/2 Models 56 and 57 have raised ome eye-rows: They brows. They come standard th 2.88M-byte floppy disk ives. The highest density ppy disks will hold 1.44M tes of data (IBM'a drives will

and 1.44M-byte and lesser ca-scity disks), so the new drives pacity disks), so the new unseem somewhat superfluous.
Not so, says Sigmar H. Tullman, director of marketing at BASF "We've got these products ready to go. Our competitors have products ready to go. It'a a case of having tires before the product of the products ready to go.

If a a case on many gives before the car is ready."

Toshiba America Electronic Components also expects to see 2.88M-byte disks as a big new product, issuing a release pre-dicting that by year's end, vir-tually all systems makers will of-fer 2.88M-byte drives.

or, but the company is pushing rward with its 486SLC. This set product is already ready to

work processor for pen comput-

Software

NEW PRODUCTS shipping Imara Lite, a productiv-ity tool for stand-alone personal

go. Its features include a cache that is double the size of that in the 386SLC in a smaller die fac-tor and a 20/40 clock doubler.

tor and a 20/40 clock douner. IBM says it might come out with chips that run at clock tri-pled or quadrupled speeds in the not so distant future. One possible concern: What to call a 486SLC2 Cyrix just introduced

neers from such companies as Zenith Data and NEC Technol-

applications packages ura Lite combines image

Imara Lite combines image capabilities, fax processing and document management. Peripheral options include a laser printer, fax modern, scanner, optical disc and imaging board. Imara Lite runs under Microsoft Corp, la Windows on a standard PC and requires on network operating system or database surver.

Imara Lite costs \$295.

Financial-related plus such as writing sales orders, preparing expense reports, snalying desian and making presentations are all functions of Numero. Tasks are performed on pieces of "work puper," which look like real puper. Users can write, errase and laphight dreat write, errase and laphight the write, errase and laphight the real puper. When the present prepared in the present present the present 111 Peter Street Toronto, Ontario M5V 2H1 (416) 581-1740

Timeslips Corp. has announced Timeslips 5 for DOS, an expense tracking, billing and accounts re-ceivable system. only the page, and scale it to be on a screen of any size. Numero's paper design capa-bility provides numerous colum-nar grids per page, eight differ-ent data types, and the ability to specify the page layout with lines, fonts and graphics. It is eivable system.

Timeslips 5 assists execu-ives in keeping track of time and an neeping track of time and expense charges. It has software that provides management reports for budgeting and accounting processes. Two modules divide Timeslips 5: TSTimer and TSReport,

peose charges and tracks em-

times the life), for the same

beginning this summer and can be used by plugging into the DC-volt slot. AER will then go after OEM accounts becau the battery does not fit in the standard NiCad slot.

A Lillipution PC While NCR had little to do with its own microprocessor — dubbed the 486SLC — and IBM its NCR System 3170 notebook computer — the next NCR computer — the next NCR portable product will be a joint development, said Ed Cote, now director of product manage-ment and marketing for the NCR notebook group. Cote said Speaking of Cyrix Richardson, Texas-based chip maker Cyrix had a busy suite in Chicago, away from the Com-dex/Spring '92 show floor. Engi-neers from such communion as the product will be a sub-notebook with at least an 80Mbyte hard drive in it as well as ogies popped in for high-level meetings, and Cyrix boasted that some of the nifty communica-tions facilities of the 3170. The oduct will appear in 1992 but obably not until late fall.

it is close to agreements with 15 hardware vendors, beyond the four aiready planning to use its chips. Cyrix also had systems on Calling the South Pole On tap at Zenith Data are pen based systems, according to display that use its unannounced DX version of the 486SLC. As once systems, according to One, which is based on Intel'a 386SL, has an internal code name of Penguin and is slated for release later this year. Zenith Data is also developing a 1486-based pen system, but this will not ship for some time, either, selling what could be a active ough for portable use ttery that lasts for eight is. AER said it will retail a and waiting in the wings is a combination pen- and keyboard

reports, data analysis, graphs and project status from the time and expense records produced in

The single-user version costs \$299.95. A two-user network version costs \$599.95, and a package of three additional networked stations costs

239 Western Ave. Essex, Mass. 01929 (508) 768-6100

Software utilities

Fifth Generation Systems, Inc. has created Direct Access for Windows 1.0. Direct Access provides a flex-

ible structure for grouping pro-grams under the Microsoft Corp.'a Windows Program Manr. It allows users to launch applications with a single keyroke or click of the mouse and

offers password security and ap plication usage mentoring. The product costs \$99. Fifth Generation Systems 10049 N. Reiger Road Baton Rouge, La. 70809 (504) 291-7221

Canon U.S.A., Inc. has intro-duced LBP-4 LITE, a laser beam Atech Software, Inc. has created AllFonts, a typeface collection for personal computers. AllFonts for Home and All-It is a 4 page/min, unit that of-

Acer hits market with line of entry-level PCs

BY CAROL HILDEBRAND

tive offer," said Olend King, di-rector of product marketing at The Acer Group, King said the price cuts are made possible in part through a new design that Direct-market personal con Direct-market personal computer er makers are turning from the hounds to the hounded, as top-tievel ines aimed directly at the mail-order mavens. The latest example comes from The Acer

The San Jone, Calif.-box company recently announced AcerMate, a line of PCs that will Acer Mate, a line of PCs that will be carried through Acer reseliers, but, according to the company, would be priced aggressively enough to compete with such wendors as Dell Computer Corp., and Gateway 2000 — two wellknown direct marketers. Naming the resellers is Computertand Corp., which picked up Acer's products in late March.

Lower pricing
"We're offering products within
10% to 15% of mai-order pricing, which makes it a very attrac-

Suite 125 5964 La Place Court Carlsbad, Calif. 92008 (619) 438-6883

5 Irving Terrace Cambridge, Mass. 02138 (617) 547-2188

night integration mothers, and the minimum and

into good ones. This time, sources say, it took advantage of a flaw in its 386SL chip and announced it as a low-coat version of the SL. When the chip appeared a few weeks back, one source at a major hardware vendor said that this was "just another Intel marketing gim-mick" for a product that needed

art chrough a new design that atures a screwiess snap-to-ther housing that is more effi-ent to manufacture, as well as a ghly integrated motherboard,

Fonta for Business each cost \$79.95 and include italic, bold, bold italic and hollow styles. In total, 400 typefaces can be pro-duced. Both versions support all fers 300 dot/in. output and comes with eight bit-mapped and nine scalable forts. Two inte-grated circuit-oard slots, one scalable and three bit-mapped font cards are offered. The print-er has 512K bytes of random-sc-cess memory, which can be ex-

cess memory, which can be expanded to 2.5M bytes. It has a receiving buffer size of 1 Kbyte.
The price of the LBP-4 LITE is \$1,249.
Canon U.S.A.
One Cannon Plaza
Lake Success, N.Y. 11042
(516) 488-6700

Attain Corp. has introduced In Control, a to-do list manager for the Apple Computer, Inc. Macin-

In Costrol gives users the ability to collapse and expand their hierarchy and use other organizational features such as Sort and Match buttons. The application is both System 7.0 and 32-bit computible and supports virtual memory. It costs \$129.95 Storage Dimensions has intro-duced the Tape S000 for the Ap-pie Computer, Inc. Macintosh. The product is an 8mm-tape sub-system that allows up to 5G bytes of unsupervised backup prescriptions.

bytes of dissipervised decling per cartridge.

Tape 5000 offers a 500 K byte/sec, data transfer rate and a search speed rate of 37.5M byte/sec. The unit uses 8mm he-lical scan technology and has a mean-time-between-failure rating of 40.000 hours,

Prices start at \$6,459. Additional cartridges cost \$59 each. Storage Dimensions 1656 McCarthy Blvd. Milnitas, Calif. 95035

Imara Research Corp. will begin

priced at \$399.
PenMagic Software
310-260 West Esplanad
North Vancouver, B.C.

COMPLITERWINELD

MAY 11, 1992

Informix **Database Technology Helps DHL Deliver** "Faster To More Of The World."



When DHL Worldwide Express® wanted to speed up the movement of thousands of packages through customs and improve customer service, they turned to us, Informix, the experts in UNIX* relational database management systems. orldwide Distributed Package Tracking System.

DHL required a system that would track packages on thousands of flights to over a half million customers around the globe. They needed a database that would stand up to the corresponding large amounts of data and high volume of activity, and they needed to make it available to virtually every DHL office worldwide. DHL chose Informix's UNIX solution.

pooding information Through a Blobal Motorerk.

DHL used Informit's application development tools and OLTP server chnology to develop and run Track and Trace. This transaction-intensive applic on complements DHL's other systems and enables employees to better serve stomers by quickly determining package locations and expected arrival times.

DHL Worldwide Express and thousands of other companies have called on

us for 12 years to successfully handle their critical data. If you're considering UNIX for data management, talk to Informix.

Because we're the experts.

INFORMIX[®] THE UNIX DATABASE EXPERTS.



If you run database applications on a mainframe, we admire your patience.

Computers have spoiled us all.

When we first saw them finish tasks in minutes that used to take hours, we were impressed. When they did it in seconds, we

were ecstatic. But then what happened? Your mainframe took on more tasks, more users, more data. And now, with all the other demands being placed on the host, your database users have to sit

there and wait for their information. Quite a few companies have solved that problem by offloading some of their mainframe applications to Sun SPARC-

server" systems. Our new multiprocessing SPARCserver 600MP Series is the very model for fast database throughput. Load one with four processors, and you're in for some of the industry's best transaction processing numbers."

Then you can boost performance up to 50%

more with Sun Database Excelerator software. Besides speeding up transactions, it also lets you add more users.

Still, the value of a Sun SPARCserver is not only that it keeps people working instead of waiting.

It also keeps you from worrying,

You don't have to worry about the cost, because a SPARCserver system costs far less than typical mainframe expansion options

You don't have to worry about data access, because users will enjoy timely and transparent access to all systems on the network -- including the mainframe.

And you don't have to worry about which database will run on your Sun SPARCserver, because software is available from all of the major DBMS vendors

Look, computers impressed you once. A computer can impress you again. Call 1-800-426-5321, ext. 465, for our Danabase Performance Brief.

Go on, call. Your company has waited long enough.



WORKGROUP COMPUTING

IN BRIEF Unisys to up LAN efforts

Amoco storage server clears net snag

BY MARYFRAN JOHNSON

CALGARY, Alberta — Migrat-ing from a pair of IBM 3090 mainframes to a Unix-based net-work of workstations and serv-

ON SITE

Lotus offers Notes library

BY ROSEMARY HAMILTON

MARI MRIG MARI RIME

By the end of this week Computerworld readers will have spent over \$29.6 Billion on

Information Technology this year - representing nearly half of all IT spending to date in 1992.

COMPLITERWORLD

SUCCESSFUL WORLD LEADERS USE SUPRA SERVER FROM CINCOM.



Try SUPRA free, and you'll see why over 600,000 SUPRA users can't be wrong.

Thousands of companies all around the world have discovered the best quality, best price, best value and best success with SPRA¹⁷ Lody's SIZRA is a prone, SQL-based, high-performance, relational database that runs across all platforms... from the largest MYS/ESA mainframe to VSE to Digital WX to UNIX to the PC. With SUPRA, applications can be designed and developed on any platform, deployed to any other platform, or connected in a Client/Serven-newtork. And, the open architecture of SUPRA allows you to keep up with changing data needs, and easily integrate future technologies. SUPRA is backed.

by comprehensive service, support and education from Gincom, a ploneer and education from Gincom, a ploneer and leader in the software industry since 1958, with over 1,000,000 users in over 5,000 locations worldwide. Call today for a free trial of SUPRA. or free copy of the latest MIC* Data Base Product Report on SUPRA, and you'll see why successful communies are makine The Smart Choice.



Amoco server clears net snag

logies to schemosophiore for oil.

out 15G to 20G bytes of seismic

out 15G to 20G bytes of seismic

stion are added to the network

sp," said Emie Shulz, an explora
stems analyst at Amoor Canada.

edenownst to users
d on file usage patterns, the RMS
aver migrates data transparently up
storage hierarchy from Sun 600MP
ers to the Epoch-1's magnetic diska.
those disks reach capacity, the softsutomatically transfers inactive files
tirel discs.

ware attentically transfers nature field to produce the control of the control of

AAAI-92

16, 1992 San Jose, California

Arcserve gains SCO, Mac support









Smooth client/server takeoff at United

Moving off mainframe eases scheduling of airline's 8,000 pilots, 17,000 flight attendants

BY GARY IL ANTHES

CHICAGO - United Airtic CHICAGO — United Airlines has few systems an emission-critical — or as computationally demanding — as the one that plans the monthly interensis of its 8,000 pilots and 17,000 flight attendants. When the airlines moved the crew-acheduing application from a mainframe to a chent/server environment, it not only saved millions of dollars in computer costs but also gained qualitative improvements in its

quantative improvements in its schedules. Although United officials said they are happy with the cost sav-ings and increased user produc-trivity brought about by the his-tority brought about by the said that moving the application out of the glasshouse has caused the airline some problems that are only slowly being solved. or to chess

Because University an automorphism unaber of combination of Ubli-ed planes, crews and cities, testing every alternative for a monthly scholake and then pick-tug been been proposed to computers. However, the more computers. However, the more computers. However, the more forms, just as the best of these proposed and proposed to the computers of the pick-gam can test. The best of the pick-ture of the pick-gam, seeds to maintain the amount of paid time that can prod wording for Hights. But its

nistration regulations. Subbash Desai, a research an-

in chess, not all moves are permitted; the model must also fa-ter in countrisies such as union mules and Federal Aviation Ad-Now, each of the 14 schedu ing analysts gets his own dedicated processor on a multipro-cessor Silicon Graphics, Inc. computer on an Ethernet local-



alyst at United, said the applica-tion was moved off an IBM 3090/600 mainframe because it could not get enough processing cycles. One process — schedul-ing the domestic narrow-bodied fleet of planes — took 150 to fleet of planes — took 150 to 200 hours of CPU time per month, he said. Moving the ap-plication allowed United to avoid

network. The analy work on a monthly schedule two work on a monthly schedule two or more months in advance, tweaking and fine-tuning it con-tinually, said Steve Greenfield, systems analyst. "They'll run it time and time again. Sometimes they'll let the job run for two instes and sometimes for the stire weekend," he said. Desai said the analysts do not cossarily produce their final

sachedules any fisater now than they did when they used the mainframe, but they have more time to perfect them. He said United expects to save between \$1 million and \$1.5 million and ship is they having more efficient schedules. United spent a little less than \$1 million on those they are the set of the set of the state of the set of the s

pite those happy resur-

Fortran model on the Siston Graphics server and gets results back in SAS on the RS/6000.

The SAS front end is accessed via Network Computing De-vices, Inc. terminals running un-der the X Window System. "We've made it so users don't have to know the first thing

NITED'S MODEL, CALLED Paragon, seeks to minimize the amount of paid time that crews spend waiting for flights. But as in chess, not all moves are permitted.

moving from a monolithic main-frame to a heterogeneous, multi-vendor LAN has presented some difficulties. "We have had a chal-lenge supporting the Unit act envi-ronment and the network." said Maryanne Deaton, manager of Corporate research and develop-ment. "This is the first or need application of its kind at United Airlines, and the support people in MIS have struggled to com-up to speed."

up to speed."

When asked if the new environment offered reliability and
security safeguards equivalent
to those in the mainframe data
center, Deaton said, "We are excenter, Deaton said, "We are ex-traordinarily optimistic and hopeful, but that is exactly the is-sue we are dealing with now. We tried to get that squared away in the beginning, but on the main-frame side, there's 20 to 30

about Unix," Greenfield mid.
The application produces inthe application produces intitle and a chicage schedules where a
trip might, for example, involve
a Chicage-based craw completing a brite-day round trip that
includes Las Wgass, Los Angeles
and Seattle. Those individually
application continued to the conposition of the continued to the constantial continued to the contentinued to the constantial contentinued to the constantial contentinued to the contentinued to the constantial contentinued to the constantial contentinued to the conten

ulea, called lines, by another ap-plication running on a Prince Computer, Inc. minicropater. Called the Selective Bidding System (SBS), that application produces alternate internates on which pales and flight atten-chants can bolt First choices go to the most senior people. Like the BM mainframe, the Prince is also getting crowded, and Unit-ES (SEO) on the LAN as well, Greenfield said.

hanced performance. It also supports Microsoft Corp.'s Windows and extended memory managers running on the PC.

The flash memory allows users to upgrade the product via software rather than by replacing read-only memory hardware.

The sdapter costs \$795.

Proteor

Proteon 2 Technology Drive Westboro, Mass. 01581 (508) 898-2800

IMC Networks Corp. will intro-duce its TP Hub/16 at Interop

duce its TP Huh/16 at Interep Spring '92 next week. The TP Huh/16 is a 16-port 10Base-T Ethernet huh. It pro-vides 16 RJ-45 ports, built-backbone connection options and a universal power supply. It supports IEEE 802.3 standard network interface cards at dis-tances up to 325 feet. The hub can be daisy-chained to exmand the network.

The hub can be dasy-chaine to expand the network. TP Hub/16 is priced at \$995. IMC Networks 16931 Millikan Ave. Irvine, Calif. 92714 (714) 724-1070

Instant CICS Dumps CDDF, the CICS Dump Display Facility is waiting. CDDF displays and prints dumps on demand and archives them as your dump data sets fill.

Display CICS transaction dumps on-line Check problem severity immediately

rint full and partial dumps on demand No waiting, information when you need it

Standard dump datasets and interfaces Supports CICS 1.7, 2.1, 3.1, 3.2 and 3.3 CPU licenses start at \$6,500. Call today for your 30 day trial.

NETEC INTERNATIONAL, INC. P. O. Box 189549 o Dallar, Texas 75218 (214) 343-9744 o Fax (214) 343-9009

Peripherals

signed new plug-in printer shar-ing cards for the Hewlett-Packsing cards for the Hewlett-Pack-ard Co. LaserJet.

The LaserNet ShareCard is offered in three models. The SC-6 provides six serial inputs, the SC-7 has six serial and one paral-lel input, and the SC-10 has 10 serial inputs. ShareCards plug into the Optional I/O slot on the

HP LaserJet. Pricing starts at \$495 for the stern Telematic 5 Sterling Irvine, Calif. 92718 (714) 586-9950

Software applications packages

Lucas Management System Inc. has announced Artemis Prestige for Windows Version 1,1, a client/server project m

NEWPRODUCTS

agement software package.

Prestige for Windows handles
multiple users and multiple concurrent projects. It supports
standard databases from Oracle
Corp. and Gupta Technologies,
Inc. running on a host Digital
Equipment Corp. WAX or a localarea network server.

Divine states at \$6.205 cm. ern Telematic, Inc. has de

Pricing starts at \$6,295 on a LAN server, \$10,475 on a VAX. Lucas Management

Systems Suite 350 12701 Fair Lakes Circle Fairfax, Va. 22033 (703) 222-1111

Proteon, Inc. has introduced the ProNet 4/16 P1392 Token Ring adapter, which includes upgrada-ble flash memory.

The card works with IBM AT/XT-based personal comput-ers and features the company's RupiDriver software for en-

BREWERS RETAIL THOUGHT THEY WERE OVER A BARREL

46 At Brewers Retail, we developed a mission-critical system to monitor sales and inventory levels for our network of over 450 beer stores throughout Ontario. We had over 120 special ingredients that we needed to have on tap for our unique 4GL mixture. These features were imperative to support our on-line Store Balancing System.

The only application development system that met our requirements was UNIFACE. It gave us the platform independence we needed to support our existing DOS PCs, our UNIX Sun Sparcestations and our 366 PC clients running Windows in a client/sever configuration. The UNIFACE 3-schema architecture reduced our coding time, simplified maintenance and ones our soulcations consistent.

In the future, we look forward to developing applications based on graphical user interfaces such as OpenLook, Motif and Windows, all of which are supported by URIFACE. The Store Balancing System has given us convenient access to all our operational data, as well as a powerful new decision support tool. ⁹⁷

-Pompi Malik, Manager of Systems Development

If you've got an open client/server development project brewing, call Uniface at: 1.800.365.3608



UNIFACE (GL. is envitable for STEASE, ORACLE, INFORMEX, INGRES, Rds, RdsS and 17 other REMINIFES, and runs under Windows, Mail, OpenLock, Proceedings Manager and Character Uner Interfaces.

Unifore is a registered trademark of Unifore R.V. UNIX is a registered trademark of UNIX System Laboratories, Inc. All other trademarks are the property of their respective owners.

MEET OUR MANAGEMENT TEAM

"No two networks are alike. By manufacturing and developing the industry's broadest product line, we can tailor any network to our customers' needs."

S. Robert Levine President & CEO



Ethernet, Token Ring

At Cabletron Systems, we recognize the integrated networks of today provide your company with the competitive advantage it needs tomorrow. In response to your needs we've developed the broadest product line of leading-edge technologies that fully integrate under Cabletron's powerful network management undersity.

Intelligent Hubs

Cableton's Multi Media Access Center intelligent wiring hub series connects Ethernet, Token Ring and FDDI local and wide area networks together in a single chassis. Our other hub products include standalone devices for 10BASE-T and Token Ring smaller connectivity environments.

Management Platforms

Remote LANVIEW*/Windows, the industry's
first management software solution for SNMP

Ethernet and Token Ring networks, was the world's first network management software package to offer completely integrated worldwide desktop LAN/WAN management from a central control console.

And now we've brought network management to a new level with SPECTRUM," Cabletron's advanced management platform, that goes far beyond the current generation of management systems to provide a cohesive, powerful and flexible environment for managing multivendor networks.

> :ABLETRON SYSTEMS

The Complete Networking Solution

Corporate Headquarters 35 Industrial Way, Rochester, NH 03867-5005 (803) 332-9400 and FDDI

Desktop Connectivity

Descript Convectinity
Occurrences more, including Cabletron's own Ethernet and Token Ring Desktop Network Interface (DNI®) adapter cards, the industry's first manageable adapter card solution, as well as our entire line of manageable 10BASE-T and Token Ring connectivity

It is easy to see why Cabletron has become the leader in network management technologies. That's why over 22,000 customer sites already use our products to connect more than 2 million network nodes. Use Cabletron's network management team to give your company the competitive edge it needs.

With more than 35 offices worldwide, there's a Cabletron location near you. Call us today at our headquarters for our product brochures or to arrange a live demonstration.

European Heedquarters: Network House, Newbury Business Park, London Road, Newbury, Berkshire, England RG13 2PZ 011 44 635 580000

ENTERPRISE NETWORKING

Pathworks lures users

BY ELISABETH HORWITT

BOSTON - Wide-area network and corporatewise document management are among the fea-tures that are tempting users to enhance their existing local area network environments with Dig-ital Equipment Corp.'s Path-

works.
Users who hovered around the Pathworks booth at the DECworld '92 conference here

Remote networking shows gains Barrage of products expected to promise cost-effectiveness

Product innovations for cost-ef-fectively blending remote branch sites into corporate net-works continue to apiral with an-nouncements from tel likes of Micom Consumications Corp., frame relay start-up Cascade Communications, Inc. and As-com Timeplex, Inc. Expected users washt for ser.

Network helps to focus giant eye on heavens

BY GARY H. ANTHES

KAMUELA, Hawaii - Last Nonber, a chanter and a priest med traditional Hawaiian ssings to the world's largest issings to the world's surgest lescope, which was under con-ruction at the summit of the rmant Mauna Kea volcano 1,600 feet above the Pacific. Thanks to those blessings and

Thanks to those bleasings and a consucopin of computer and networking technology, the W.M. Kock telescope — four times more powerful than the one at Palomar Observatory near San Diego — was completed four weeks ago and this month is expected to produce some of the most stunning vistas owne of the most stunning vistas over seen of the courses. This

huge, high-tech fusion of optical and computer wizardry is the first in a generation of telescopes that will revolutionize astrono-

that will revolutionize automo-y, ucientiza said. Computer and communica-tions technology has shaped en-trons technology. I shaped has been also also also al-ticology and the found in the con-traction of the contract of the con-traction of the contraction of the con-signed and then ground to a classification of the procedured accuracy under procedured accuracy under the classification of the con-signed and then ground to the procedured accuracy under procedured accuracy under the classification of the con-signed and then ground to the classifica-tion of the con-signed and then ground to the classifica-tion of the con-traction of the con-



Your enterprise is complex. Your communications solution shouldn't be.



you the flexibility you need to connect your enterprise just the way you want.

It's a complete PC-to-host communications solution, providing an efficient, elegant way to solve even the most complex communications problems. And, you're not locked into a single, approach or method. It's simply the most advanced communications software available.

- The Crystal Point software family offers: > TCP/IP, X.25, Asynch Server support
 > emulations for IBM, HP, DG, DEC, Honeywell
 > multiple file transfer
 > multiple network support
 > DOS, Windows, and OS/2 support

- Call (200)487-3656 today to learn about the Crystal Point solution and to receive a FREE white paper on enterprise communications.

Crystal Point

IONES & JONES INVESTMENT

UNIFARCE

JONES & JONES INVESTMENT

JACK LOWE, VICE PRESIDENT

ITTERMIX CHICARD

JONES & JONES INVESTMEN

LITTLE ROCK, CLEVELAND, PRILANDEPHIA

DEPARTS AND SANDLAS SANDL

UTTE MOZ CEREAM, MILAGEMA,

JONES & JONES INVESTMENT

LITTLE ROCK, CLEVELAND, PHILADELPHIA, RISTRA BAFFALO WICHTA JONES & JONES INVESTMENT

LITTLE NOCK CLEVELAND, PHILADELPHIA, ROSTON RIFFALD WICHTA DALLAS

ONES & JONES INVESTMEN

JALK LUWE, VILE PRESIDE LITTLE ROOK, CLARLAND, PHILADRIA JONES & JONES INVESTMENT

JACK LOWE, VICE PRESIDENT

LITTLE NOCK CLENELAND, PHILADELPHIA,
BOSTINI, BUFFALD, WORKE,
BALLAS, NEW YORK LOS ANGELES TRANSMIT

JONES & JONES INVESTMENT

LITTLE ROCK CLEVELAND, MIN ADELMAN, Doston, Buffald, Wichta, Dallas New York, Los Angeles Toronto, Tocho, London

Only one e-mail system has been able to keep up with the Joneses.

cc:Mail™

It's been with companies like Jones and Jones Investment since their humble beginnings. You see, because its underfring architecture was built to be sealable right from the start, it can grow as a business grows. In fact, it's so sealable, it can accommodate 5 to 500,000 users—without losing efficiency as it grows ccMail even runs on heterogeneous network environments. So adding users out to the network it as simple as loading a disk.

Because of its unmatched scalability, ceMail is the proven solution for over 40% of the Fortune 500. Its cross-platform capabilities and its impressive set of administration tools may also have somethics to do with his widespread popularity with over 1.5 million customers workfwide. One more thing ce-Mail has won every major industry award, including Infloword's

major industry award, including InfoWorld's 1991 Product of the Year Award, Byte Magazine's 1992 Annual Reader's Choice Award and LAN Times' 1992 Reader's Choice Award.

So for a free demo disk of the cc:Mail Macintosh," Windows™or DOS Platform Pack, call 1-800-448-2500.

cc:Mail. It can keep up with everyone in the business world. Even the Joneses

cc:Mail

Printers built for the long run.

Complete and the postage paid card for more information about GENICOM's family of long-nunning princers, supplies and service. For faster response, call 00014-GENICOM Dept. C, or fax card to (203) 949-1392.

spirory overs

Name.

City______State_ | Tim interested in. | Laser printers | Mutnix printers | Line printers | Ali

4 How many printers do you plan to purchase during the next 12 months?

1-5 6-6-6 11-5 2-5-5 5 5 9-5

Please check this boar if you would like to have a GENICOM representative call you. Use printes DAs

What are your applications'
picase check at this apply
Day codes Daugharry
Hutipart forms Direct Graphics Dither

3 Willow will you be purchasing printers?
D-9 moratis Honoriss D-9 moratis
D-9 moratis Honoriss D-9 moratis

GENICOM



BUSINESS REPLY MAIL
PRIST CLASS MAIL PERMIT NO 124 WAYNESBORD, VA
POSTAGE WILL BE PAID BY ADDRESSEE

GENICOM
One Genicom Drive
Waynesboro, VA 22980-9942

-

Synoptics broadens SNMP choices

SANTA CLARA, Cald. software package recently an-nounced by Synoptics Communi-cations, Inc. was designed to al-

work management platforms.

Lattis Views is said to manage
Synoptics' LattisNet line of intelligent hubs on IBM's AIX NetView/8000, Digital Equipment
Corp's DECENCE Management
Station for Ultrix or HewiettPackard Co.'s OpenView Net-

Products help remote nets CONTINUED FROM PAGE 71

lay service than for use within the WiTel network. This is be-cause WiTel is already using feeder switches from another

feeder switches from another vendor, she said.

Brown added that the STDX will eventually include an interface into standards-based Asynchronous Transfer Mode (ATM) cell-relay networks. However, she emphasized that Cancade intends to meaning in the frame-re-

the emphasized that Cascode in-ends to remain in the frame-ends to remain in the frame-en-sy business and has no plans to secone an ATM weader. One analyst noted that Cas-del's product does not address a sake. "Ubers will have to plunk he STDA' right next to existing multipleares they'll still need for voice traffic," and Doug Gold, incretor of communications re-erench at International Data control of the Cascon Timeplex cont, the company's 85,200-

nd-up entreeLink+ teeder utiliplexer, stated to ship in sty, supports up to 44 ports at seeds up to T1. Compatible tith and manageable by Ascom imeplex's Link multiplexer ne, the device is aimed primarine, the device is aimed primari-at the vendor's current users to are looking to extend their etworks to smaller sites. Automatic Data Processing, i.e. in Roseland, N.J., is using the product for that purpose.

the product for that purpose. However, director of communi-cations Ken Breault said that when his firm first needed a low-cost feeder multiplexer, Ascom Timeplex did not have an offer-ing, so be went with another

endor.

That product did not inte-rate well with his management cheme, he said, so he moved to ntreeLink+. Economics pre-lude him from replacing the ther vendor's units.

Don't ask this group to share just any printer.



The multipurpose printer for demanding workgroups. Here's a rugged, serial dot matrix printer built

to handle even the most difficult multipart forms, labels and bar codes.

Dual paper paths. The 3840E lets you load two reis forms Then w a simple local or remote command, switch



te, so the last page of a six-part form is ose from an array of resident fonts

The GENICOM 3840E is Novell-certified and compatible with everything from ELS NetWare* to NetWare* 386. And it's the only dual-path printe that's DEC* LA210-compatible. For IBM* Systems 3X and AS/400, GENCOM offers the 3940E with twinax and coax interfaces.

Network printers for the "90s.
Like all GENCOM printers, the 3840E, 3940E and
the economical, single-path 3810S are backed by a
worklywide service and support network. To find
out more, call 1-800-4-GENCOM ext. 34.

Pathworks lures users

existing NetWare installutions. However, several information systems managers voiced con-cerns about whether the prom-ised benefits would outweigh the added cout and overhead of in-stalling yet another client/server package on their LANS. Inco Ltd. is interest-ed in using Pathworks to provide security fea-

ucks the capability, be all indiction, now will like to growle its. NetWise servers are considered to the control of the contr

Several users cited DEC's su-perior wide-area networking ca-pabilities as a major reason for adding Pathworks to their LAN systems. One network manager said be would much rather use DECnet than Novell's IPX as the

ms to LAN-b

routing protocol between geo-graphically dispersed Novell LANs. A DEC representative as-sured him that DEC servers can now encansulate IDY. now encapsulate IPX transmis-sions so that they can be routed

sons so that they can he routed over DECaet.
Glazo Riddings PLC originally acquired Pathworks as a way to "integrate PCs with each other and with VAXs," said Jon Stanley, an IS manager at the London-based international pharmaceutical firm. Now Glazo is todding at Debausche a. is looking at Pathworks as a way for users to exchange X.400-compatible E-mail and to track

ticular interest to Gizzo, he said.
Darden Graduate School in
Charictterville, N.C., in titunking
of buying Pathworks as a way to
integrate its NeWare LAN's
with three WX/VMS hoots, according to Andrew Boyston.
District Control of the Control
of the Control of the Control
of the Control
of the Control
of the Control
of the Control
of the Control
in the School's networking and system capabilities.

"We want our grad-uate students to he able to dial into the system from remote statement and you can't do it very nd you can't do it very well with Novell," Soynton said. Dialing nto a WAX is compara-ively easy, he added. However, Boynton

about the price they would have to pay per personal computer for Pathworks in terms of

software costs, over-head and administrative hassle. "Users feel that

Bucher said.

In addition, a new licensing convention that DEC recently announced requires each Pathworks user to he licensed at the workstation level, Bucher said.

"Right now, a network ad-

"Right now, a network ad-ministrator can make up one set of Pathworks on a disk and carry it from workstation to worksta-tion," he said. In contrast, the new convention forces the ad-ministrator to "crack open 30 packages in plastic seal." In general, however, Bucher

In general, however, Bucher said he was impressed with the latest version of Pathworks, particularly its ability to bring up WAX applications via DECwindows and PC-resident programs via Windows 3.0 on the same

Cabletron hubs relieve bandwidth clutter

BY JOANIE M. WEXLER

ROCHESTER, N.H. — To pr vent network bandwidth fro getting gobbled up by manag getting gobbled up by mans ment traffic in centrally m aged configurations, Cablet Systems, Inc. last week dist uted some functions of its hi level Spectrum network m

to the transmission of an appeared system down to its intelligent wring centers. Software for Collection is medium to the control of the collection is medium to the bab to poil localisera the bab to poil localisera to the collection is control of the collection is control of the collection of the co

fined thresholds, he said.

This acheme procludes volumes of management information indicating healthy LAN conditions from clottering up the
network performance, Cullerot
said. He added that the software,
dubbed Distributed LAN Monitor (DLM), will work with Spectrum or any other centralized. trum or any other centralias high-level network mana; based on the Simple Netwo Management Protocol (SNMP)

Reducing SNMP traffic "Currently, SNMP traffic is one of the largest traffic pipes in our network." Said John Soogin, su-pervision of network operations at Delmarva Power & Light Co., a Cabletron shop in Newark, Del. He said his firm is currently re-censation for a network into four

He said his him is currently re-gionalizing its network into four major hub sites interconnected by multiple T1 lines. "We're looking to reduce the amount of SNMP internet traffic

coming back to the data center and get more into a "manage-ment by exception" scenario," he said. Scoggin said he also hopes to reduce the load on his central Sun Microsystems, Inc. SPARCatation management sta-tion, "which is practically load-

OFTWARE FOR CABLE-TRON'S Intel Corp. 1960-based hubs allows the hubs to poll local-area network devices locally.

ed." by distributing his management functions.
"An network size grows, especially in the TCP/IP world, the overhead succisated with management traffic increases and can be a substantial sissee to users," asid Kevin O'Neill, vice president of research and consulting at Business Research Group, a consultantacy in Newton.

Mass.

O'Neill said that based on his firm's research last year of 400 corporate network managers, users seem to want a hybrid distributed/centralized management scheme.

site." O'Neill said.
Cabletron' a 495 DLM software, available now, can be implemented on the \$7,996 management module of Cabletrus' high-end Multi Media Access
Center. It also comes as a \$495
option to the wendor's MfXX-24
a \$3,995, 24-port, 108tas-27
in telligent wiring center also announced last week.

Ameritech tests ISDN in telecommuting pilot program for customer service reps

BY ELLIS BOOKER

y declared to put this concept to he test in its own business. Late last month, Chicago-ased Ameritech Corp. said it would deploy ISDN lines and pecial software to a handful of

representatives as part of a year-long trial. Ameritech — the par-ent of Bell companies in Illinois, Indiana, Michigan, Ohio and Wis-consin — will use an ISDN-based software package called PhoneServer from Unif Com-munications Corp. in Billerica,

No cell distributors
The PhoneServer software and ISDN combination eliminates ISDN combination eliminates the need for expensive, hard-ware-based call distributors,

As an incoming call arrives at one of Ameritech's ISDN-capa-ble central office switches, it is directed to a Unifi "phone serv-er," a Unix-based controller that transfers the call to other num-bers. Calls can be routed accord-

"We can route calls directly to specific workers in the field by tapping into the signaling chan-nel of the ISDN line — essentially uning it as a network control mechanism," said Jeff Spotts, Unifi's director of product mar-

ISDN

ital Basic Rate Interface (BRI) ISDN line. Each BRI provides two 64K bit/sec. channels for data or voice traffic and a 16K bit/sec. signaling and packet data channel.

ing to information conveyed on the ISDN signaling channel, such as automatic number identifica-tion and dialed number identifi-

eritech is already test Server with 10 serv

An Ameritech spokeman and the company will decide at the end of the year whether to add the ISDN-based work-at-home solution to its customer service operation. Ameritech may also market the PhoneSer-ver/ISDN application to outside

Syncordia to carry Big Blue traffic in Europe

BY ELISABETH HORWITT

Syncordia, Inc. has become a network service provider, last even provider, last possible service provider, last bottom services for IBM's Information Network of the State of the State of the State of Syncordia, nanononodo context for Syncordia, nanononodo context for Syncordia, nanononodo context for Syncordia, publicatory. The three-year contract is valued as more than \$10 million a year, according to Syncordia spokesman Jack Baird.

The British Felection subsidiary will

Net helps focus eve on heavens

and commands to motors that twice each econd nudge the 6-ft, 880-pound mirrors to viewing positions accurate to a mil-mth of an inch.

licenth of an inch.

The telescope's aim is also directed by Motorola, Inc. microprocessors, and its instruments, when installed, will be controlled by San Microsystems, Inc. Scalable Processors Architecture processors, all consected by TCP/IP over Ethernet. Ucers will interface to those computers via a Micro'NAX running Digital Equipment Corp.'s version of Motor with the X

ommoth data collection one might expect, a 10-meter mirror ptures a lot of data. The Keck will make captures a lot of data. The Keck will make some 10 to 20 observations per layer, each with 52M bytes of information. The data will be written to magnetic disks at the telescope and transmitted continu-ously to optical disk archival storage at Keck headquarters here. The headquarters here. The headquarters in connected to the mountaintop via a 1.5M bit/sec. line, over which Lewis and his staff of 15 program-mers and analysts can send software-chaners.

er's and analysis can send sortware ranges. Lewis said bendwidth will have to be sosted when the telescope goes into full codection, possibly to several 6.3M bit/ c. lines. A settlife link may also be es-blished to campuses of the University of alfornia and the California Institute of exclusiology, which built and now operate

conougy, white telescope telescope. Eventually, Kock scientists hope to e advanced techniques called adaptive tics to sharpen the telescope's focus, hile the Kock's mirror gathers 17 times. ore light than the mirror in the space-sed Hubble telescope, it must contend th some blurring produced by the atmo-here. Scientists are experimenting with

ural networks — speciaized comput-is that minic the nervous system — to move some of that distortion. That kind of image processing could betantially improve the Keck'a focus, id Peter Winnowich, optics manager the telescope. The advantage of the abble is dwindling as these techniques

Datacomm Commentary

"Access is as important as information: that's why LEXIS' 2000 MODEMS are UDS"

MeadDataCentral



As the world's largest full-ten information services, LEXIS* and NEXIS* open a whole refer ence library to network us And on-line information re And on-line information reti-generates an especially sensi-requirement for modem reli-bility, cost effective performs and timely technical suppor-

That's why the UDS FasTall

V.32/5 was selected for the upgrade of the LEXIS* and NEXIS* services from 2400 to 9600 bps. As it does for many customers UDS has relabeled the selection as the "LEXIS" 2000 MODEM,"

as the "LEXIS" 2000 modern while retaining all the standard FasTalk V.32/5 features. The modern is fully compliant with CCTT recommendation V.32 CCITT recommendation V.3 for full duplex 9600 bps com-munication over dial-up lines With MNP 5 data compression When LEXISTNEXIS*

need business, financial, legal, government or other information, they tap the services via an economical, hyper-reliable UDS modem. Couldn't your data network profit by that example? For specifications, prices and modem application assistance, contact UDS at:

800-451-2369

XIS 2000 MODEM

Now there's a compasfertile as the mi

Lotus' Notes' is more than a technology story. It's a breakthrough solution that solves real business problems by helping you harvest the collective expertise within your organization. Not to mention making better use of your existing hardware, software and network investments.

> Look at the challenges on the business horizon.

deliver to your customers. Notes is the tool that helps you accomplish all this with relative ease.

What's more, if you're an IT or MIS professional, you're concerned with finding a better way to leverage the technological resources already in place within your organization.

Without incurring major expenditures of time and money.

With Notes, you can deliver customized and flexible applications

There's the perennial need to be more competitive. To grow the business. To get closer to your customers and suppliers. There's also the need to do more with less. And to enhance the quality of the products or services you

groups in less time. And for less money. That's because Notes gives you an open, application development environment to work in. Where the widest.

Lotus Notes is an innovative, workgroup computing enviro

uting environment ndsthat work in it.

variety of applications that facilitate information sharing can be quickly developed and deployed to multiple users at multiple sites. Regardless of what networks, applications and operating systems are in place.

With Notes, both IT professionals and end users can work together to create applications that solve very specific problems. In fact, right now there are small and large companies using Notes for sales lead tracking, product planning, brainstorming, account management, project tracking, call reporting, quality management and a whole lot more.



"With Notes we now have a quicker, more efficient way of determing some incredibly useful applications to our people. For example, we created a asstomer information and profile application that was up and running in less than two months. Now that's fist.

Parther down the road, when existinging a model that arrays are a triatal from menting for everyone the or preparations; are a triatal from menting for everyone to the or preparation; when it into, well have all the renournes of the rest of the organization behind as and arealable to see Which means at IT professionals; we will be in a much better position to help our company, realize its business goods. And to bring a better level of service to our customers?

Ciba-Geigy Corporation



All of which makes Lotus Notes much more than a single application. It's an environment that's extremely flexible. Plus, it runs on the most popular networks such as Novell," IBM," Microsoft" DEC" and Banyan." And in

Windows' and OS/2." Of course, just as we've done, with 1-2-3," we're comitted to having Notes run on all major platforms, including Macintosh' and UNIX." Plus there are many third

there are many thi parties offering a range of products

and services that further extend the value of Notes.

What's more, when you look at all Notes can do—and how quickly it can do it—it's not very expensive at all. In fact, you can get started with Notes for about \$500 per user.

So call us today at 1-800-872-3387, ext. 6702. And see how Lotus Notes is cultivating a better environment in which people can truly work together.



nment designed to increase your organization's productivity.

Try Explaining To Your CEO That Network Response Time Is Poor Because Your Routers Don't Have A Symmetric Multiprocessor Architecture.

Most router vendors give you two ways to deal with network growth, neither very appealing. Either spend big bucks on a new router, or stay with what you have and learn to live with progressively slower performance. Wellfacer, on the other hand, lets you expand your net-



ing processor modules to your existing routers. That'
the kind of flexibility inherent in our advanced symmetric multiprocessor architecture. For a Wellfeet
Architecture Report, please phone 1-800-448-3400
ext. 485W (r will

When Your Networks Are Complex, Your Choice Is Simple.

Experience the "Next Generation" of CASE.

Discover how for the next generation of CASE can take you. Experience the power that comes from using a CASE tool designed to work with you, not against you. With capportable the insteaded upersystem inchange, a common GAI, user-customized graphics, and partiably of information cross Windows, OS/2 PM and Macistesh workstations. Sign up today for a handers on SIVERIAN deem cord is set 1000) 537-4362.

> CSA Computer Systems Advisors, I 50 Tes Med. Woodelf Lais, NG 07675 (RO) 337-4262 in Consta (418) 687-5764 The Right Tool For The Right Job.



NO POSTAGE NECESSARY IF MAILED • IN THE UNITED STATES

BUSINESS REPLY MAIL
FRET CLASS PERMIT NO 125 WOODCLIFF LAVE, NJ
POSTACE WILL BE PAID BY ADDRESSEE

CSA

Computer Systems Advisers, Inc. 50 Tice Boulevard Woodcliff Lake, New Jersey 07675-9878

U.S. Rebotics, Inc. has out the prices of its WorldPert portable fazimodems and Sportiers modies. WestBirst 2469 Fazi Data drive is now \$379, reduced from 3490. Other prices are as follows: World-Pert 9000, \$559; Sportsers 9500 externational, \$559; Contracts 9500 externational, \$559; and Sportser 9500/PC. U.S. Roberiter 9500/PC. U.S. Roberiter 9500 M. McCommick Bird. \$100 N. McCommick Bird. \$100 N. McCommick Dird. \$100 N. McCommick Di

Micro-to-host

InterConnections, Inc. has added File Sharing Services to its Leverage for NetWare product line. File Sharing Services allows Novell, Inc. NetWare users to store files on any Digital Equipment Corp. WXXVMS sys-tem and print NetWare-generated output or VMS prairies.

The product is an upgraded version of etWare for VMS, developed by Inter-onnections and previously marketed by

ages from \$1,500 to Pricing \$13,000.

InterConnections 14711 N.E. 29th Place Bellevue, Wash. 98007 (206) 881-5773

Customer-premises

Telematics International, Inc. has amounced new lower priced models in its Telematics Net25 Fregrammable Commitmenton Processor product line.

Telematics Net25 Fregrammable Commitmenton Processor product line.

Telematics Net25 Fregrammable Commitmenton Processor product in the Commitment Processor product in the Commitment Processor Processor Products and September 2018. It is also also provides a 15th bytes of memory and support for five processors. It is practed 485 2018.

Telematics 1201 Cypress Creek Road Port Lauderdale, Pla. 33309 (305) 772-3070

Links

aser Communications, Inc. has intro-luced a laser transmission device for link-ng extended Token Ring local-area net-

works.
The Lace L00-50 system connects
LANs at distances of up to 1 kilometer at
4M/16M bit/sec. channel speeds. It is
protocol-independent and does not require special knosning, the company said.
A complete system costs \$23,200.

1848 Charter Lane Lancaster, Pa. 17601 (717) 394-8634

Gateways, bridges,

Raycom Systems, Inc. has designed a Source Routing Transpurse thrifty to Children Ring networks.

The Model 3440SRT Local Tokes Ring Periode suntestically routes both Professional of 8000 3337-4328 tody

MAY 11, 1992

NEW PRODUCTS

e-routed and trampa-ogenous local-area networks. transparent routing mode, the p filters data at 153,600 packet/sec. crate an integrated fiber-op-torate an integrated fiber-op-to-fiber backbridge filters data at 153,600 packet/.
It can incorporate an integrated fiber-tic interface for connectivity to fiber be

The standard model costs \$5,200; with the fiber-outic extender, the price is \$5,800

Raycom #C-8, 16525 Sherman Way Van Nuya, Calif. 91406 (818) 909-4186

Rabbit Software Corp. has announced the 1,0 Open Advantage APPC Server for

It is of g to run their

Rabbit Software Great Valley Corporate 6 7 Great Valley Pkwy. E. Malvern, Pa. 19355 (215) 647-0440

Pricing is set at \$3,59 nOptice Communic

Finally, A CASE Tool That Works On Two Important Levels.

Your Professional Level And Your Frustration Level.



SILVERRUN – The Macintosh Leader In CASE. Now Brings Relief To The World Of Windows And OS/2.

Why settle for lower expectations, and less than professional results? Now SIVERIAN* meets your personal and professional needs for CASE tech nodays that high on make and but on instruction. Coming stargly from non-reviews in the Macmooth world, SIVERIAN is packed with an abuse dome of ordermood and presental instructs to ensure that your modeling appropriations will now be met.

Using the workstation platforms you already have — Windows, OS/2, and Mocinish — you'll levenge the lates date driver, object oriented technology to constuct large, comprehensive, not world data and process models to need any relational requirement.

Developed by expert modellers, SIVERTUN is an officiabile, professional CASE tool designed to help you get the job done loser and better, not to get in your way. And with its open architecture and broad angue of capobilities, SURREVIN can enhance and complement your existing CASE environment — or by the only solution you'll ever need.

COMPUTERWORLD

SA II for the Name | Command of Street

Introducing Harmonix AS/400 Cached DASD



Today EMC's Harmonix Series of Integrated Cached Disk Arrays (ICDA'') dramatically advances every standard by which AS/400 DASD is measured.

Harmonix ICDA utilizes both read and write eache to eliminate traditional rotational delays. Cache sizes are adjustable to maximize speedmaking Harmonix the most flexible solution ever introduced to midrange users.



Harmonix is fully 9336 compatible—but offers up to 330% more capacity in the same footprint. And that capacity stays available continuously. Because the same intelligence that boosts processing power also ensures the highest DASD reliability. Dynamic Sparing, Disk Serubbing and other preventive maintenance features keep more data available, a lot more of the time.

Harmonix is available in both 5.25" and 3.5" models each modularly designed for easy upgradeability.

For a technical summary of EMC's ICDA technology and more information on Harmonix, call 1-800-222-EMC2 ext. M238A.

EMC²

currence, COA and the DMC legs are trademarks of EMC Concession. ASHIOD is a restorment of EMM Conpension.

LARGE SYSTEMS

Memorex reveals disk, tape strategies Automated tape library extended in

anticipation of IBM, Storage Tek intros

BY JEAN S. BOZMAN

In a broad-ranging package announcements, Memorex T tourscements, Memorex Tel-Corp. recently introduced ducts that will extend its Me-rex 5400 automated tape li-

same not 13 disk and tape prod-tetrategies. About 300 units of the origi-1 Memores 5400 tape library, ill with Fujitsu Ltd. tape drive mponents, have been sold artivoide, which is far less than apetitor Storage Technology pry's installed base of 3,900 tomated libraries. Memores Telex executives del they hope to increase salase.

d they hope to increase sales the coming year by offering ore choices to users of large-

formation systems planners.
Chief among the new products is the \$144,000 Memorer.
Teles \$100,0 a downsted library
that contains 315 cartridges instead of the fall library's \$0,000
cartridges. The Memorer \$100
cartridg

Unix system on deck for Louisville Slugger firm

BY KIM S. NASH

LOUISVILLE, Ky. — By the time you flex and bend through the last seventh inning stretch in October, Hillerich & Bradsby

ON SITE





Problem: Managing and controlling printing and Solution; BIM-PRINT, BIM-QCOPY, BIM-ARCHIVE

Open systems.

Everyone agrees they're

No one's debating whether open systems are a good idea, but you'll hear plenty of discussion about what open systems are. Some insist, for example, that an open sys-

Some insist, for example, that an open system is a UNIX* system. But to others its whatever it takes to get their different operating systems, networking protocols and databases working as one, and the sooner the better.

That's why IBM views open systems so openly. To us, they begin less with particular technologies and more with the needs of your business.

The real goal is to liberate information that's trapped around your company, so more of your people can use it more easily, and to open commu-



nications with customers and suppliers, who no doubt planned their systems without thinking about yours.

And of course, you need to accomplish all this without scrapping your existing multivendor investments.

So the paths to open systems will vary, but there's one thing that won't-consistent industry standards. IBM is fully committed to open systems, so we're equally fervent about standards.

We're active on over 1,200 standards initiatives. We're a sponsor of OSF," a member of X/OPEN," and we support ISO," ANSI" and IEEE™ to name a few. And when a new standard holds promise, we support its development.

What's more, we offer AIX for UNIX users and we are improving our SAA™ and AIX systems to work more openly with each other and your non-IBM systems. So as you move to open systems, your investments will be protected. We can also help you open your system with consulting services and technical support.

At IBM, we now measure everything we do-from the desktop on up-against a yardstick of openness. It's what we have to do because it's what you want to do. To get more information, call us at

1 800 IBM-CALL.

Unix system on deck for Louisville Slugger maker

Unisys systems have — but it runs on timer technology. [The OS3] operat-system won't be around forever,"

bring up a Unisys-supplied server sed on The Santa Cruz Operation's 20 Unix. A Unisys imaging system that I be integrated with the Unix setup has mady been installed in the records stor-

He said be could not estimate time or money saved but noted that customer service clerks are now able to handle

"If Kenart or Wal-Mart calls up and wasta a record of orders for the last three years, you get everying eight three, in-years, you get everying eight three, in-Hildrech & Bradsly mores a lot of product, opencially during it two buy seasons: per-Christmas and pre-Opening Day. The gaps as the left feasible more buy The gaps as the left feasible was to hard the company of the company of the hard three company of the company of the stall three company of the company of the called an open of the company of the called an open of the company of

extensive bur-coding system ring from order entry to the loading courses through Hillerich & Brads right sites and keeps tabe on orders by filed and shipped. It is the biggest applien that Grubbs and his 19

printed.

Workers scan the terminal screens an select jobs to do based on when the ordenast be shipped. Once a job is started—ay, the manufacture of a donen 33%-in 30-ounce bats for the Atlanta Braves

This printer will still be productive when Michael becomes computer manager.



Facit's new volume printer, the Facit E950, is designed for really demanding applications. It handles round-the-clock operations at 320 lines per minute and features Facit's new FlexForce print head which can produce over 1,500,000,000 characters (that's 1.5 billion') with no reduction in print quality.

The 8-part form handling is characterized by excellent print quality on all copies. Furthermore, the E950 provides advanced paper handling including on-demand forms delivery.

And, unlike other printers, this one is so easy to use, it's child's play. All functions are controlled via just two keys and an easy-to-read LCD display. That's just the beginning of how the Facit

E950 can make you more productive. Get all the E950 facts and our new "Tough Printers for Tough Applications" booklet. Write Facit, Inc., 400 Commercial Street, Manchester, NH 03101-1107. Or call 1-800-TRY-FACIT (800-879-3224) for immediate assistance.

FACIT Tough Printers for Tough Applications

ACH MAJOR LEAGUE player uses an average of 72 bats per season, but Hillerich & Bradsby supplies — in addition to wooden bats — 100 models of aluminum bats to colleges, high schools, retailers and corporate teams.

Otis Nixon — the worker attaches the ap-propriate sticker to the bats-in-progress and passes them to the person at the next

ishipping clerks scan the bar code to re-trieve a mailing label showing Nixon's ad-dress and all pertinent order information. Then the bats are borned and sent on their way to Brayes Stadium in Atlanta.

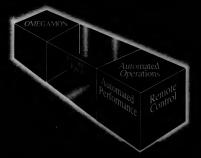
ably rely on in-nouse takens and may use Unisys to do the migration instead of or ing for a third-party firm.

"We've been writing our own st since 1971. The stuff we manufacture a

the way we do it are unique; so is our so ware," James said.



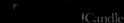
When is Candle's data center Automation Solution unbeatable? With OMEGAMON!



Better together, forever.

- OMEGINON INTEGRAL (1 desc.), a.s. n.a. s. a. (1 f.k.) M. PERIORIER and M. REMO E. (3 desc. a.), for ONE-GINON fortog a made (1 a. n.a.)
- Who have speed outling 11 for a first many consequence of system threats study is Wesderd when the 18 study a first is so along automation solution goes of the first system a who may be a first many consequence.
- Intermedial problem resolvent in the line of a section of present critical problems significant in the line of the section of the line of
- From the Vislam's in problems is a description of all 1800 863 37 to day of dask in our new 355 of the original section is the second of th





DEC turns to service in utility sector

BY THOMAS HOFFMAN

nue for DEC annually and is growing by 26% per year, according to Bill Johnson, vice president of corporate marketing at DEC. Still, the firm has its hands full try-

NEAL State, the tirm has its names nut try-ing to win over potential customers where it has failed before. "We've invited DEC into our shop a umber of times to see if they could in-more our operations, but they've always ome up short," said Bud Collins, vice reason of the state of the said of the one of the said bud collins, vice reason of the said bud collins, since said to the said bud collins of the said to the said the said to said to said s

DEC's latest program is Digital's Utili
Network Integration Technology (DECunity). The program is a utility-fo tems and application integr

plans to make available later th EPRI is a Palo Alto, Calif.-based is consortium whose members include mor of the major utilities in the U.S. and Ex

EPRI.

Even though DEC has more 1,000 customers in the utilities man including Tokyo Electric Power Co., i inh Gas PLC, Pennsylvannia Powe Light Co. and Detroit Edison Co., company will have to work hard to

me new accounts.

Not all of DEC's utility customers see a

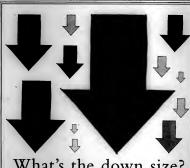
services.

"We use DEC SNA gateways to link our BM 3090 mainframe with our DEC WAX 9210 and VAX 6510 machines, so I don't think we really see a noof for these services," said Richard Marx, director of ation services at Comm ic Co., the Wareham, Ma

nom Bätiste, senior consultant at CSC Partners, a Waltham, Mass, consulting firm, said he believes the new program could help DEC leverage more sales. The utilities industry "is a very IT-driven busi-ness, but historically it hasn't been a very well integrated IT environment," Batiste said.

Sequoia expands system support

ed a support network de



What's the down

There's no question that computing costs are out of sight. The question is, once you decide to reduce costs by downsizing your mainframe investment, how do you determine the "smartest" size? Or, how will you best utilize your human, hardware and software resources?

no down side."

With UniKix software from Integris, you can find the right "down" size. Your CICS applications will be migrating effortlessly into the less expensive UNIX environment. Your programmers won't need retraining. And you (and your company) will immediately start appreciating computing cost savings of as much as 6:1 - the up side of downsizing. At Integris, we are dedicated to belping you reduce computing costs through

SmartSizing. Would you like some more information? Call us now for a copy of our Downstzing, Rightsizing, or SmartSizing? white paper. There's

NTEGRIS 1-800-765-2826

of of ENEX System Laboratories for, or she USA and other co

Legent, Landmark to share technology

BY GARY H. ANTHES

VIENNA, Va .- Legent Corp. and Land-VIENNA, Va.— Legent Corp. and Land-mark Systems Corp. recently announced an agreement by which they will offer us-ers an integrated, consistent look into combinations of their mainframe prod-

ts.
Legent has licensed Landmark's workstien-based tool, NaviGraph, for downding, displaying and analyzing the outted mainframe performance monitors,
spent will use the product to provide a
munon, graphical user interface to its
siatirame products and to combine and
anaputate the output from multiple Leent and Landmark products on one
roen.

LTV Steel COrp., a major user of prod-ucts from both companies, has agreed to be a lext-seed in fie for the new Legart ver-of network and computer operations, and, "It's something we've been trying to do for the past 10 years — to view multi-screens and to do in as consistent way." New Kircaph comes in two linked com-ponents code numing as a file server on crossift Corp. Windows application on one

nore IBM Personal Computers. The drame piece downloads performance from CICS/MVS, CICS/VSE, MVS.

tors, asswing users to nee the perior-mance of the whole machine at once. Legent's first implementation of Navi Graph is expected in the first quarter of next year. One version will allow users to combine, display and analyze the output from Legent's Astex, MICS StorageMate

"For users, if they have both Legent

Now there's a true high-performance information service with automatic transmission.

NEW PRODUCTS Turnkey systems

Kodak Electronic Printing Systems, Inc., has amounteed an upgrade to its Kodak Prephery Color Production Systems.
Edicate 2.1 of the Printing Systems, improved Swap Good Commonary requirements and a link to the Acids PCS100 Image Station.

John Plan have also been enhanced, the company reported.

Job Files have also been enhanced, the company reported.

The complete Prophesy system, in-cluding a Sun workstation, costs \$89,500.
A software upgrade to Version 2.1 costs \$25,500; Prophesy users under service contract will receive the upgrade free of

Marge. Marge. Kodak Electronic Printing Systems 164 Lexington Road Billerica, Mass. 01821 (508) 667-5550

I/O devices

Lexi Computer Systems Corp. has an-nounced the availability of the Intermate 3270 kit, which lets mainframe users print on a Hewlett-Packard Co. LaserJet

inter.
The product is installed in the HP inter's I/O slot; it connects to the mainure via coaxial cable and to a personal emputer or local-area network via serial purallel cable. It supports all standard M features and emulations, according

8) 521-1118

It's called DowVision, and it

livers it automatically, which means the news arrives while it's still news. Just as important, it arrives for a fixed monthly fee so affordable that dient constitutional insulations. old very well make manual infor-mation retrieval a thing of the past. Because it brings you the power of the world's premier business and fidirect access to real-time business news need not be limited to just a few mem-bers of your staff. And DowVision is nancial news services automatically, and at turbocharged speed.

Here's how it works. Based on customized profiles that can be set easily incorporated into your company's enterprise-wide network, or its customized profiles that can be set up for your entire company, or each department, or even individual users. Dowl'sian delivers precisely the kind of news and information your staff needs. And only what they need. (These profiles are simple enough for anyone to set up, and just as simple to change; Dowl'sian selects this news from the vast resources at its command, in-

rious LANs.
All of which makes DowVision the one information service that can automati-

1-800-522-3567, Ext. 751.

cally enhance your company's perfor-mance. For more information, just call our mance. For more inf

DOWVISION'

DowVision selects this news from the vast resources at its command, in-cluding Dow Jones' widely respected real-time newswires and the full text of The Wall Street Journal, as well as BusinessWire and PR Newswire. And de-

LARGE SYSTEMS

ES/9000: Faster — but tricky

Evaluations of the Model 900 reveal that IBM's largest mainframe is twice the speed of the 3090, but fiber-obtic channels are difficult to implement

BY MICHAEL L. SULLIVAN-TRAINOR

hen it comes to horsepower, IBM delivers. But Big Blue still has not made its new mainframe features any easier to operate, according to early users of the Enterprise System/9000 Model 900, IBM's latest largest mainframe.

Four users, members of Computerworld's Product Evaluation Council, conducted in-depth evaluations of the Model 900, which is in production at their sites. Their

findings are reported below in New Product In-Site,

findings are reported below in New Product In-Sitte, a monthy section of Comparisonnel Intelligible of the Intelligible of Comparisonnel Intelligible of the Intelligible of Comparisonnel Intelligible of Comparisonnel

240 MIPS.

Deep discounts were achieved by the companies interviewed, but the evaluators still expressed concerns about the system is overall price.

Escon channels are expensive, and users are having difficulty implementing

the model 900 at 225 MIPs.

Company 2 performed benchmarks to determine the capacity of the Model 900 to the 600]. It had espected the 900 to be about 1.76 times faster, or 210 MIPS. Instead, it achieved about 1.04 times faster. 1.94 times the performance of the 600J, or about 232 MIPS, using the same work load for both systems. Comsany 2, which is in the transportation industry, has a work load that includes

With time installed ranging from two months to six months at the user sites, the ES/9000 Model 900 has never failed in a way that impacted opera-tions, according to the four evaluators. Company 3, which started using the system last winter, had to repiace one part but has not had a single hardware

near that amount. Gartner Group rathe Model 900 at 235 MIPS.

ra rince then PERFORMANCE ed to perform at twice the ca-Promised to perform at twice the ca-pacity of the previous generation's top of the line (30%), 600(J), the sto-proces-or ES/9000 has encreeded their expec-tations, the evaluators said. One com-pany received a promise from IBM that performance would increase to 272 MIPS. But Gartner Group, Inc. report-ed that no user has reported anything accretion source. Corp. Com-ment of the company of the com-pany of the com-servation source. Corp. Com-

application processing windows dramati-cally. Processing time for a large DB2 batch application was reduced from four hours to under two hours. TSO transaction response time, which is measured daily, improved by about SUPPORT

tions a day.

IBM's level of service is usually highest for this class of product, and the Model 900 is no exception. Evaluators report-ed that most service problems are han-died routinely by local support staff without significant delays or problems. The companies all reported very smooth installation processes and well-coordinated on-site efforts by their IBM support teams.

coordinated on-size curve or the same of t

PRICE

With a list price of \$22.6 million, you can't buy a more expensive mainframe from IBM. But most users are not paying that price because of IBM's desire to push the new line and replace the previous generation. Migration deals are offered for 3090 users who up

are offered for 3090 unces new grade.

While all the uners interviewed re-ported taking advantage of the migra-tion option, they rated the price at or sightly above what they expected paying for a competitor's system that offered the same capacity. The users also used they think the operating system should be revived securated.

priced separately.

• Company 4 reported that setting upcompetitive bidding situations markedby helped them get better deals in the
negotiations with IBM.

• Company 3 liked the deal is received
but found the filter channels pricey.
The fact that the MVS operating system is tied to the size of the machine is

a sore spot.

On maintenance costs, James Cassell, a vice president at Gartner Group, reported that IBM has the users over a

"Maintenance pricing is not tied anywhere near to cost. There are less parts in a 900 than there are in a 3084, and yet the maintenance price is signifi-cantly higher. However, we are finding that as cu

with a very high volume process that handles more than 4.5 million transac-**HISER REVIEWS** tions a day.

• Company 3 found that the faster ES/9000 processors, coupled with the higher speed channels, collapsed batch collection processing windows dramati-

MIGRATION

Users reported that the installati signation to the 900 was very smooth of very similar to implementing an-ther 3090 class system, with the



UMMARY OF EVALUATION

or exception of the Escon channels, ich are difficult to use because they puire an adaptation of the current mnunications channels.

SIZE

nd that the ES/9000 Model ers found that the ES/9000 Model 0 uses about the same space as the 90 Model 600J, but it allows twice e capacity and therefore consolidates to cester space. The system required me reworking of the power supply, wing from 400Hz to 60Hz systems.

OPERATION

e evaluators found that the system not make it any easier for their is to operate. The users are still agging with the implementation of Eucon channels.

Excor channels. According to Cassell, users have nd Excor very difficult and some-at perplexing because they can't get re than 96 parallel channels on an 19000. This quantity does not allow licient benefit to move to a more

ufficient benefit to move to a more outly environment.

Company 4 reported that it using he name number of staff members to the name number of staff members to the persons writer. Company 3 reported that the biggest halfenge was making sure the staff un-terated all the implications surrounds the persons of the staff un-terated all the implications surrounds to the staff understand the staff under the company 3 reported properties to the staff of the staff of the When company 3 installed the 900, it untailled Escon channels. However, it and to instaff converter to talk to the 1990 controllers because the features to uppose the 300 of weren't residence to uppose the 500 of weren't residence.

IBM responds

AUTOMATION

DUSTRY TRANSPORTAL



Number of processors:	,	
Product installed:	Early 1992	0
Total support staff:	100	
Other processors:	IBM 3090, 6005 Amdahl 5680, 500A	
Amount main memory:	512M bytes	
Amount expanded storage:	512M bytes	
Number of channels:	128"	
Eacon channels used:	No	

	4
BATTHOS	
Reliability	3
Performance	4
Support	4
Price	3
Migratios	4
Size	4
Operation	

NDUSTRY: BAT	INDUSTRY: BANKING	
Number of processors:	1	
*Product installed:	Late 1991	
*Total support staff:	80	
*Other processors:	IBM 3000, 600)	
*Amount main memory:	1G byte	
*Amount expended storage:	1G byte	
•Number of channels:	128	
*Escon channels meet:	Yes (48)	
*Operating system:	ESA (Intent leve	
*Application: On-line IMS and	TSO as well as	
DR2 batch conficutions. Very bu	war on line work	



		*Product installed:	Late 1991
ATTIMOS.		*Total support staff:	734
eliability	5	*Other processors:	5 IBM 3090
erformance		*Amount main memory:	S12M bytes
spport	4	*Amount expended storage:	512M bytes
ice		•Number of channels:	128
igration	3	*Escon channels used:	Yes
ne .	3	*Operating system;	MVS SP 4.1
peration	3	*Application: DAS, non-DAS by	ech program
nochamote	3	on-line programs. Very high vol	ume (greater
L. Call	4,1	4.5 million transactions daily).	
	_		

BATHORS
Reliability
Performance

BATTHES	
Reliability	3
Performance	3
Support	5
Price	3
Migration	3
Size	4
Operation	3
Automation	1

Г	INDUSTRY TELECOMN	IUNICATIONS
l	*Number of processors:	3 (2 olice)
н	*Product installed:	Late 1901
	"Total support staff:	Not available
ı	*Other processors:	3 IBM 3000s
н	*Amount main memory:	1G, 768M, 768M bys
н	*Amount expanded storage:	
П	*Number of channels:	96, 64, 96
П	*Focon channels need:	Yes
П	*Operating system:	MVS/ESA

at COMDEX, one product is recognized varied than any other, and named

1 50 0 5 10 W

Introducing Z•NOTE. The future is built in.





See what Thinking Ahead will Call 1800-523-9393.

APPLICATION DEVELOPMENT

CASE . LANGUAGES . TOOLS

Converting to client/server

Early users of NCR's Cooperation say the benefits outweigh drawbacks

BY ELLIS BOOKER ATLANTA - The benefits of

ent for enterprise computing. Cooperation includes devel Cooperation incusives ocver-opment tools, runtime clements and such user applications as electronic mail rolled into an ob-ject-oriented, client/server envi-ronment. The package is part of NCR's road map for future com-puting, which the firm outlined

deliver applications consistently across the enterprise," applained Gail Port, head of applained Gail Port, head of applained Gail Port, head of applained to the second development at Chicak NA in New York, which in avenuer 1990 became the

J. D. Edwards enters CASE market with AS/400 tools

BY KIM S. NASH

DENVER -- Users of IBM's Ap-ENVEX — Users of IBM's Ap-ication System/400 can baild w applications as well as modi-existing programs with new mputer-aided software engi-ering (CASE) tools from J. D. iwards & Co.

t, a tool kit that in-

d sequelatence though the announcement irts the company's formal for-into the CASE market, the year-old firm has been using see CASE products internally eight years to build financial

MAY 11, 1992

priced between \$7,500 and \$50,000, depending on which AS/400 model is targeted. Foun-dation Environment is free, bun-dled into the price of J. D. Ed-

GUI generators speed development

SLICED MY development time rom a couple of months to a couple of FRANK CASTELLUCCI

C.O.L. SYSTEMS

and supporting files for OS/2 1.2, 1.3 and 2.0, as well as Mi-crosoft Corp. Windows applica-

COMPLITERWORLD

COMMENTARY Erran Carmel

EMS speeds JAD sessions

int application design (JAD) facilitators e discovering that there can be more to D then flip charts and donats. Enter a class of systems called elec-nic meeting systems (EMS). EMS puts rorkstation in front of every partici-nt in a meeting. Attendees can partici-

onent in two ways. The erwes to equalize participation. cilitators have always had a chal-

coaxing the bashful. When there are 10 participants in a 1AD session, each gets only about six mix titses of air time per hour. Whit EMS, participants have equal access to the loyboard, creating a livel playing field. One of the key factors in eliciting all participants' feedback is that much of the conversation through EMS software is anone versation through EMS software is anone.

ond, JAD sessions take a long time

— often days. People begin fidgeting in their seats, and managers get anxious that key employees "get back to work." With EMS, tasks can be "sent out" to the workstations of all participants, wh then work at their own speed on those topics in which they have a stake.

Break for business world Some people call EMS groupware, while others classify it as collaborative compu-ing. But what makes EMS unique is the

ing. Dut what makes nons unique is in it supports the act of meeting. "The business world has been starv-ing for solutions to the inefficient meeti-problem," says Roger Volkema, an expert on meetings at the American University in Washington, D.C.
Electronic JAD sessions can be run on systems from Tucson, Ariz.-based Ven-tana, which is a spin-off from research done at the University of Arisom, Ven-tana's product is called GroupSystems, which is composed of a dozen text-bases tools that run on a network. Each of the tools is generic and can be used to fit a consister of the spin of the contract of the tools.

continued to the process of the proc

JAD. facilitators have been bringing CASE tools into JAD sessions for several years now. EMS addresses group work issues, which CASE cannot because it is used in JAD sessions in a facilitated

mode, a sustained with the best and facilitation are thrilled by all the hardware. Some argue that EMS as CASE but the 'group dynamics' of a meeting, that special atmosphere that emerge a face several hours between the facilitator and the user-puricipants. Ultimately, it is up to the facilitator. Some can use the computer to enhance the process without loning the 'warm fuzzes,' while others led more comportable with matthers and eard paper, all with matthers and eard paper.

GUI generators relieve users

CONTRUEDPREMENS 9

"For most than list."

There might consider that a conservament of the second o



IBM acquires equity in Sapiens

■ IBM has acquired an equity position in Supiens International Corp., a soft-ware firm in Cary, N.C. in conjunction with the investment, Supiens announced that it will port its rules-based applica-tion development tool. Supiens Worksta-tion, to the OS/2 platform.

The Chatsworth, Calif-based Dyka-lor Division of Sterling Software, Inc. has acquired Dynatest for Win-dows, a programming aid, from Innova-tive Business Systems, Inc. A testing program for the development of Micro-soft Corp. Windows applications, the

II Knowledge Information Sys-tems, Inc. in Hatlet, NJ., has an-nounced q*BASE_ERE, an Xhase com-piler for The Santa Crus Operation's SCO Unit; palsfrom, Q*PASE_ERE can com-bine Xhase files and C files into the same encetable file, and it supports multiple and taltakes programs, Available in worksta-tion and server verrions, their is no ad-ditional charge for runtime licenses.

a UGC Con in Ucc. Consustang in Dis-signed application developm with Hughes Information ogy Co. and two other com-of a strategy to provide cust ping and geographical informa-tems applications. UGC and Aurora, Colo.-b

cictions.

Meanwhile, UCC said it has been brising with Hitachil Software Engineering Co. in Tokyo and Information & Graphic Systems, Inc. in Borr, Colo., to develop specialized data-oversion software called DB-Able. The fivare can be used with UGC's Discretized of structured conversion masterness methodologies.

NEW PRODUCTS

Development tools

Motorola, Inc. has announced VMEexec 2.1, an update of its real-time application

velopment environment.

According to the company, the product's features include a runtime execu-tive, a strong runtime connection to Unix, development tools and comprehensive

vice driver support.
Embedded real-time applications are eveloped under the company's enhanced ersion of Unix and then downloaded to fotorola M88000 and MC68000 target

Accordance Measure and McCastrol arget aystems for debugging.

Pricing for the start-up kit begins at \$5,200; a combined version supporting both types of target board costs \$7,500.

The kit will be available this month.

Motorola 2900 South Diablo Way Tempe, Ariz. 85282 (602) 438-3576

Micro-Processor Services, Inc. has de-vised a PL/1-to-C language-conversion

tool.

The PLIC Translator Series converts software libraries from a variety of PL/1 dialects to Clauguage code.

Built-in math, string manipulation and I/O functions are converted to external calls, and comments are moved unaltered to the target C language file. Source code errors are flagged and diaphyed in a re-errors are flagged and diaphyed in a re-

The PLIC Translator Series softw The PLIC Translator Series software runs on DOS-based personal computers. Introductory pricing is set at \$975. Micro-Processor Services 92 Stone Hurst Lane Dix Hills, N.Y. 11746 (516) 499-4461

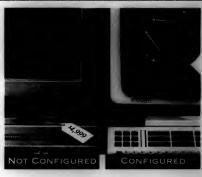
Science Applications International Corp. has announced the SAIC Visual User Environment (VUE) Developer's Toolkit.
SAIC VUE is a graphical user interface that simplifies Unix for the end user and

that simplifies Unix for the end user and provides a consistent interface across heterogeneous hardware platforms, according to the firm. The product lets users develop enhanced Morif applications, integrating the SAIC VUE interface.

The SAIC VUE Developer's Toolkit is

allable for Sun Microsyst priostations and costs \$1,250. Mail Stop 45 10260 Campus Point Dri San Diego, Calif. 92121 (619) 546-6083

MAY 11, 1992



That's why Intergraph provides you with more than just a box.

With Intergraph, there's no such thing as a colorless, diskless,

useless workstation. Our SOLUTIONStation products are configured to handle real-world applications - And isn't that why you buy a

workstation in the first place?

Call us today at 800-836-3515 or 205-730-2727 for more information on our SOLUTIONStation products and our superior

portfolio of more than 1,200 integrated applications.

INTERGRAPH Everywhere you look.

COMPUTERWORLD

WHO CARES

HOW CHEAR

THE WORKSTATION IS.

IF IT CAN'T

DO THE WORK?

The IEF works. For Aetna. For Rhône-Poulenc Rorer.

The success of Texas Instruments I-CASE product is proven—in the field.

There is an integrated CASE product that works. It works now...and it works well.

The IEF™, or Information Engineering FacilityTM, is in use now by successful companies. large and small, all over the world.

Major gains in productivity, quality, and maintainability.

Productivity gains in initial development are hard to measure, but reports of 2-to-1 improvements are fairly common—and some go as high as 5-to-1...

Quality improvements are dramatic. Users are getting more of what they need to run their businesses. Systems get up and running easier and faster. As for maintenance, a Gartner

Group study showed that, even back in 1990, more than 80% of IEF developers were getting gains of from 2-to-1 to 10-to-1.

Now, develop on PC and generate for DEC/VMS, UNIX. TANDEM, WINDOWS available soon.

The IEF has generated applications for IBM mainframe

environments (MVS/DB2 under TSO, IMS/DC and CICS) since early 1988. Now you can develop systems in OS/2 and automatically generate for DEC/ VMS and some UNIX platforms, TANDEM, Microsoft® WINDOWS, and more UNIX will be available soon.

Developers give IEF highest rating in COMPUTERWORLD.

COMPUTERWORLD magazine's "buyer's scorecard" showed that developers ranked the IEF first among all I-CASE products in the study, particularly in the areas of application

quality, programmer productivity, and value for the dollar.

New tutorial provides very fast, very friendly IEF training.

We believe our new Rapid Development Tutorial is a breakthrough in CASE training. We gave it the broadest possible beta test-more than 100 companies participated. Developers were able to learn to build systems with the IEF more quickly

than ever before-some in as few as five days!

Special "Starter Kit" offer combines new tutorial and full-capability PC toolsets.

The new IEF Starter Kit will give you everything you need to start building systems with 1-CASE on your OS/2 PC Along with the tutorial, the kit includes our standard OS/2 PC analysis, design and construction toolsets as well as testing and

COBOL compiler is optional and priced separately.) There's also 90 days of "hot-line" support. The kit is priced at \$10,000

code generation in C. (A.

(limit one per customer company). That's about one-half the regular cost of the toolsets. If you're not convinced that the IEF can work for you, here's a chance to see for yourself-at a

special low price and (with the new tutorial) in a very short time. To order an IEF Starter Kit. or for more information.

call 800-527-3500. Government purchasers, please



Target. Rolls-Royce. Canadian Airlines. Sony.





F offers dramatic improvements in tivity, yet it's easy to learn. One le: We trained 23 developers, no 18 new hires, and then ted a large order processing 1—300 transactions—all in only 20.















No Matter How You Look at It The SAS' System Brings Together Your Organization's Two Most Strategic Resources.

With the SAS System's multiple interfaces, it's never been easier to bring people together with the information they need. Your entire organization-from executive suite to factory floor-can command the power of the SAS System to access, manage, analyze, and present data.

Through customized executive interfaces, the facts that support strategic decisions are immediately at hand. Managers can use Executive Information System interfaces to monitor critical success factors, forecast trends, interpret financial performance, drill-down through departmental reports, and perform other essential tasks.

Ter business and technical analysts, there are taskoriented interfaces that drive a variety of applications. Through simple menu selections. Without having to know syntax or relying on MIS, analysts can manage projects, scrutings market research data, monitor product quality, explore laboratory data, create graphs and ad hor reports, and much mark

Programmers can put the SAS System's flexible fourth-generation language to work through an interactive windowing environment that displays programs and output simultaneously-together with details about how the program is progressing. And, through an object-oriented applications development environment, programmers can link applications together to deliver virtually any information on any computing platform at any level of your oraznization.

Take a Closer Look.

For a free SAS System accountive summary—with details about a no-risk software evaluation and our renowned technical support, documentation, training, and consulting services—give your Software Sales Account Manager a call at 99-977-8200. Also call to reserve your place at our free SAS System executive briefing.coming soon in your area.

JAJ.

SAS Institute Inc. Software Sales Departmen SAS Campus Drive Cary, NC 27513 Phone 919-677-8200

INTEGRATION STRATEGIES

OPEN SYSTEMS

Pilgrims progress on the open road(s)

he nirvana of open systems is being sought fervently by companies large and small. But as in any search for paradise, the best way to get there is subject to much debate.

The many pilgrims seeking true, blissful openness are united not by a single path but by a shared vision: A world in which all hardware and software speaks to

ch other, and data is shared freely song all machines. The number of alots and converts grows daily. "We brought in an isolated island

we orought in an isolated island of open systems, but we couldn't keep he programmers off of it," says Mi-theel Higgins, technical support man-uger at Byer California.

The San Francisco-based women's

apparel manufacturer set up a small open systems pilot three years ago consisting of Sequent Computer Sys-tems, Inc. hardware and Oracle Corp. software. "From that moment on, we've never looked back," Higgins

loday, the company has scrapped proprietary Prime Computer, Inc. ems and expects its software to



Tiny dynamos advance the faith

Small integrators are leading the open systems crusade — and earning attention from users and big foes

INTEGRATING

BY MARK MEHLER

net these tiny specialists are on our lines of companies converting — so far mostly at department level to open environments. These open outliques are also drawing the attention of larger competitors, information systems managers and computer systems vehicles, and they are shaping the fature of the commercial systems vehicles.

We couldn't afford to sit down





At John Wiley & Sons, a leading technical and scientific publisher, evaluating AS/400 storage is something you do by the book. Especially if you're Mike Silverstein, Wiley's Manager of MIS Technology, After a thorough review of companies that offer AS/400 DASD. Mike selected IPL to supply all DASD products for Wiley's worldwide business support systems. Here's why.

"IPL met the three criteria we identified as absolute requirements for doing business with Wiley: superior engineering, outstanding price performance and exceptional service. With IPL, we got high-capacity

mirrored protection that was economically feasible. This company doesn't just mimic IBM; it pushes the limits of technology to benefit the user."

Doug Nagan, Wiley's Senior Vice President and Chief Information Officer, agrees, "IPL's

DASD solutions are innovative and cost-effective. We could not support new business growth on a global scale without them. IPL was definitely the smart choice for John Wiley & Sons."

To learn more about IPL products and receive your complimentary guide to AS/400 mirroring, call 1-800-338-8475.

617-890-6620 in MA. In Canada call 800-565-5606; in Europe call our Belgium office at 011-32-2725.41.58. And get your own read on IPL.

The Smart Choice for ASMOO Storage

Pilgrims progress on the open road(s)

hat true "openness" must be built three pillars of interoperability, lity and portability. Computer-recently caught up with several es on their respective journeys to s. Their stories follow.

fferent systems and/or applica-must be able to communicate and ingedata easily.

or Consumer Health Services, Inc., Consumer Health Services, Inc., the copen systems began by installing platforms linked by TCP/IP. Bouder, Colo-based firm uses an sive database to match callers with factors and dentists. The database information on where a doctor to medical school, treatment processor and control of medical school, treatment processor.

system in the process of migrating

as aya.

Rortunately, he saya, Sequent provid-plenty of help, including hot line sup-rt. "I consider myself to be an adept in: administrator today, but it was cer-inly interesting getting there," Higgins

says.

At Mead Data Central, Inc., lack of Unix experience cropped up, says Gary Whitney, director of systems evaluation at the Mead Corp, subsidiary. The Dayton, Ohio, company is moving from multiple IBM and compatible mainframes running MVS to an NCR Corp.-based open

hitney says he had to hire a Unix ex-

Dealing with bumps on the way

INTEGRATING OPEN SYSTEMS

Millipore Corp. Byer California Mead Data Central, Inc.

BY ALAN J. RYAN

re's no such thing as a smooth ride

Companies magrating from propri-yts open environments say people is-is and technical conversion problems ise life ... well, interesting. Finding people who know how to mi-tle to and run open systems can be a big illenge, according to experienced

s. silipore Corp. in Bedford, Mass., for noc, found that a lack of Unix skills slicated its switch from a mix of proary systems to Sequent Computer ms, Inc. systems. "We had no intereills on Unix," says Dan Poulin, direc-

and incidence to blaz," ways Dan Polani, diver-ce of information spitemess operations at the \$770 million corporation. "That's a thick \$770 million corporation. "That's a Millipore is ablevy site of four-year Corporation of the State of the State of the State Corporation of the State of the State of the State Corporation of the State of the

MAY 11, 1992



"Nice Idea, But Will It Fly?"

September 1990

	r-And Complete Information astest Mainframe DASD.	
OPlease send me product literature als OPlease send me a free poster.	out the Symmetrix Integrated Cached Disk Array.	
Name	1	1
Title	·	
Company		
Address		
City	State · Zip	
Phone		
CPU(s)		
Operating System		
Current DASD	T 7 5 62	
DASD Upgrade plane 100-3 mos. 103-6		
LESSEC . THE SECOND SEC	The Storage Architects	

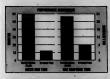


Hopkinton, MA 01748-9901

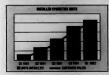
.

Macantheologidaddiaddaddianaddadd

Will It Ever!



"The Symmetrix has produced the most dramatic improvement that I have seen take place in this data center in over 10 years, including CPU, DASD and tape improvements."



Two years ago, we had an idea that mainframe users wanted reservations more quickly. Banks provide balances faster record-breaking performance from their 3880/3380- or thanks to Symmetrix. And companies of all types and sizes

3990/3390-type DASD subsystems-and from their computers. So we replaced the traditional disk design with arrays of small disks, supported by a high-performance, integrated controller and up to 3 Gigabytes of cache.

Did the idea take off? Just ask the customers who got on board-customers whose requirements for performance and data availability are the most demanding in the world. Airlines now use our Symmetrix ICDA" (Integrated Cached Disk Array). subsystems to help process worldwide utilize Symmetrix disk arrays to achieve the best control they've ever had over parts, inventory, service, productivity and profits. In data centers everywhere, Symmetrix

is making an unparalleled contribution to system speed and corporate performance. We have an idea it can do the same for you.

For more information on Symmetrix, or for a free Symmetrix poster, please call EMC today at

1-800-222-EMC2 ext. L224C.





Maybe its time to rethink your business processes.

Two early converts keep on marching



BY JOHN KAFALAS

Two early pioneers in the open systems movement have calloused feet but smiling faces. According to DHL Worldwide Express and Hyatt Hotels Corp. the shift from proprietary life was hardly easy, But would they have book? Mrs. observed.

turn back? Not a chance. Savings on software, sup and application develope time has made it all worthin according to information

DHL Worldwide

Redwood City, Calif. base DI took its first halting steps town open systems in 1986. Surpr ingly, says Michael Lanier, ch information officer at DH American operations the

DHL, which delivers pacages in the U.S. and in 194 coutries around the world, had beusing an IBM mainframe and network of System/36 minicouputers running package tracks

With the management mar date, the company purchased it Technology Corp. and Hewler

Since then, DHL has added Unix-based minicomputers and workstations from several other vendors, plus Apple Computer, Inc. Macintosh and DOS desktop machines. DHL's domestic systems are connected by an X.25 network, while the overneas machines communicate via the So-

(SITA) network.
With so many changes, problems were inevitable. The three thorniest, according to Lanies were handling communication among different endors' Unisystems, distributing dat among the systems in the work wide network and containing

nance costs.

Here's how DHL is tacklin
the problems:
• Communications: DHL i
developing an "encoder/decode

message switch" to act as a data interpreter. Developed using Pipes Platform, a software tool from PoerLogic. Inc. in Soft Francisco, the encoder/decoder is the key to getting DHL's multivendor array of Unix systems on speaking terms. It is expected to be on-line later this year,

hundred network nodes, receives a message, it translates the message into the data format and protocol used by the recipient node (if the incoming message is in a different data formats or protocol). This makes it possible to run the same application or different barmer parketerm.

An open and closed case
Comparing costs shows that proprietary systems are ch

132	On	e weer	10 users		
ш		Soft	ware		
	Word pr	ng system dsheet, occasing sbase UI	Operation Spread Word pur Date G	or system inheet recenting stone it	
	Open 83,175	Proprietary 82,134	Open 80,535	\$14,410	
ш		Har	dware		
	Unix systems, Intel 80386/30, 150M-byte hard drive, 4M-byte RAM, VGA	MS-DOS system, Intel 80386/20, 150M-byte bard drive, 1M-byte RAM, VGA	Uma Military	MISTOS WHITE W	
	Open 83,500	Proprietary 83,500	6m	Proposition 00,000	
	Total	Total	-	"Brief."	
	86.675	85.634	827.935	849.410	



DHL's Lunior says after the switch, communications, data dis bution and maintenance costs were the biggest challenges

while retaining the ability to share data, Lanier explains.

Data distribution: DHL is establishing a central data repository in Houston. The system will be based on an IBM Enterprise System/9000 mainframe System/9000 mainframe

running MVS/ESA and IBM's DB2 relational database management system. The ES/9000 will act as a "data warehouse" for customes account data, package shipment

account data, package shipment data and related information. When the project is complete, the ES/9000 will be surrounded by distributed "rings" of Unix systems, mostly IBM RISC Sys-

tem/6000a. These will run AIX and Sybase, Inc.'s RDBMS and the Open Gateway AIX-to-mainframe interface. The AIX/Sybase systems will query the mainframe for data, which will in turn be made available to remote systems worldwide vin the X.25 and SITA networks.

and SITA networks.

• Controlling coats: The shipping firm has entered into single-point-of-contact (SPOC) relationships with AT&T Communications for telecommunications cquipment and with IBM for

Lanier says DHL expects to save between 25% and 40% on system maintenance costs as a result of the SPOC arrangement.

Hyatt Hotels

At Hyatt Hotels, a single application package sparked a company

For the 160-site Chicago based chain, the move to Unix based open systems began in De cember 1987. Since then, substantial investment as, if sed conversion have mad the nowe pay off, according to

Five years ago, Hyatt officals were looking for a software application to track numerous indi-MAY 11, 1992 vidual hotel functions. The eventually chose Encore Proper ty Management System, a Unix based application from Encor

ty hamagement system, a Unix based application from Encore Systems, Inc. in Atlanta. For a hardware platform, Hy att chose AT&T 3B2 Unix systems for all but its largest hotels

att chose AT&T 3BZ Unix z tems for all but its largest hote Bigger properties, which need more power, got HP 9000/8 muchines running Encore. ' day, nearly all of Hyatt's hot use the Encore property management suckage.

With the primary system to the door was open for oth Unix-based applications. Ne. Hyatt needed an RDBMS for house applications such as te

IS officials chose Inform Corp.'s Informix, which runs or most Unix systems and has fourth-generation languag (4GL). Kerr says that in termsprogrammer hours, the 4GL "two to three times as produtive as C" for writing applic

The reservation system was written in the Informix 4GL as put into service in August 1990.

Kerr says that a key to H; att's success in switching t Unix has been converting steps, one application at a tim

steps, one application at a tim. The best approach, be adds, is convert small, stable applications first. "That way, you can get up the Unix learning cur without getting distracted things that have nothing to with libra itself." be says.

Kafalas is a free-lance writer based i

There may be a company that can make your systems work together more effectively.

Will you get the best solution from the first company that comes to mind?

Oregon blazes trail toward open systems conformance





Small integrators take lead in open systems crusade

Big Blue, ERI team up

b IBM and Hauppage, N.Y.-based integrator ERI amounce a new partnership. IBM will market ERI's systems integra-tion services with IBM RISC Systems/6000 workstations and other IBM hardware and peri-pherals aimed at the trading

orldwide OSI testing

U.S. and European com ers are working to intro-teroperable systems and wnt that can be used on

Japan's opening, too

▶ The U.S. and Japan may en-

rs, open systems integrators and to be run by sales-oriented trepreneurs rather than sea-

sow in such great demand.
Also, most apecialty open sysms integrators don't reself
divare or software, which
es them more platform indendence and a lower capital
it has then then lightyers.
Finally, the open boutiques do
not share an "I can do any
integrator" attitude.
"These needes come out of a

big integrated" attitude.

"These people come out of a prucedure code mind-set," says Larry Tanning, sales vice perioder at Super Solutions. "Migrating millions of lines of Code) off of MVS takes you into very complex issues of networking, and Unix communds. The [majority] can't address those, let alone the applications."

le's Ch

igh-level client rela hey've fostered." ile open specialist inte

tors are ascendant now, opin differ on their long-term fate.

joy more computer int lity. A little-noticed cl

SCO, Novell make plans

NO, NOVEM SMAP DIMES 1. NOVEM SMAP DIMES 1. NOVEM DIMES 1. NOVE

SPECIALISTS

Mehler is a free-basce writer based in

If you're looking for help in rethinking your business processes, what you restly need in a fresh perspective. And to get that, you need to look beyond the obvious choices.

Case-in-point: Hewlett-Packard Business Computer Systems.

HP also has close alliances with lead ing software and solutions suppliers Together, they offer the kind of forward thinking that will help you manage change better in the future Call 1-800-637-7740, Ext. 3171 for more information, including specific case studies. (In Canada, call 1-800-387-3967.)

Think again.

PACKARD





MIGRATE TO OPEN SYSTEMS

THROUGH STANDARDS

Open Systems Help You Comparte You live and work in a rapidly changing world. Open Systems will help you compete They will improve your componly solidly to communicate and exchange doto later. This means you will respond more quickly to market apportunities and to your customers' needs. Open Systems also uncrease your ability to incorporate new information technology in "very basens" by a muring your occess for the needs.

Stendards: The Key To Open Systems Open System means adherence to internationallyaccepted wender independent standards standards that define interfaces not products. Not all standards one important to your business needs. As a first step, you need to develop a Standards Profile which is a selection of standards relevant to your business. Your Profile will include standards that define interfaces in seven service areas four discount.

Migration is A Process That Peys Moving our compring environment bound upon is a process with popular solution provided in the process with popular solution provided in the force to your restring systems where you provided interforce to your restring systems where opporting you will become once sentences and the process of the provided interforce to your restring your because of the provided interforce to your restring you will be provided in the provided provided in the provided provided in the provided provided in the provided provided

Coexistence With What You Have Open is about having the best of bath worlds. Open Systems can coexist with your existing systems instead of throwing anything out you can leverage your IS investment.

Why Do These Vendors Agree? It is in their best interests to have a stable, well-defined set of industry standards - standards established by your purchases. These standards will enable them to locus their product development on solutions and technologies that old unious value to vo.



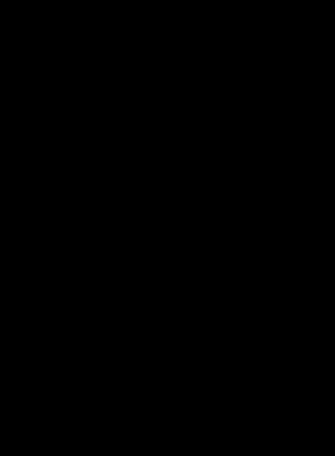
HOW YOU CAN MIGRATE NOW

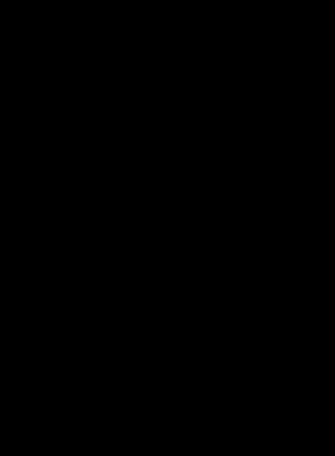
DEVELOP a Standards Profile by selecting the standards that are relevant to your business needs
 ALIGN your current systems with your Standards Profile. For example, you can add a standard network interface or operating system to your existing systems.
 SPECIEY the standards from your Profile in your continting documents.

4. PURCHASE systems that implement the standards in your Profile PURCHASE applications that are built in conformance with the standards in your Profile.

5. CONTACT thes leading vendors and organizations taday. Ask them about their standards-based products and have they can belle you migrate to

Open Systems. > > >





TEGGY

Preferry: th where and Type I har schools on industry strategis for the version, printing and publishing all documents incorporated into owe 250 products from over 40 windows 1.000.02 (no.00.00).

ALTOS

amdahi

gretes a rebust, secure, large scale UNIX system with assuing dole carden assets for musice crécel applications A APPLIX

Auss's office integration software left user create with, and shore business information perces perworks of X-based workstances

Bull 🌻 The Bull Distributed Computing Model is fill panel for systems integration provides occur to new technologies white countriesing or

(#)CINCOM SUPEAB is the only male-server EDBM: half for prediction application develop ment desired to dopo center, server SM 1800.543.3000

GOMPUTER

88apan

(S) CONTROL DATA

IBM hagging powerful open structure of a east solutions including applications, detables management tools, networking BISC based hardware and openeting sys-

Management

Data General Not get open but wide open commer coll-grade UNIX industry-leading prior/performance Coll a local sales office in 1 (6) halfs (7)

dligital

€

ENCORE

ftpSoftware.inc.

A led line of egobostom, retweeting, com-puters and standards-based operating sys-sess from Dagasti for the Open Advantage of the Communication of the Com

Manufacturer of a full line of multiple protocol terminal and printer servers to satisfy your open systems networking

ncare provides cost effective solutions for complex registers and on line trespector

PC/TCP is a fully-leasured DOS implements too of the TCP/IP protocol femily PC/TCP offices PCs and compatition to communicate

Horn' Night Howk computes on highper-formance, reclaims multiprocessing UPARB systems that any POSIE, SVD and Billopen

IF a or elementarial manifestary of products designed to be upon - PCs, waterstrong and multiple systems. Recognised for excellence in

THARRIS

PACKARD

OFTP Salwan

Wealth newspaper for information Systems defeating news, application information one product newsors for 50 professionals feeding the resignator to open systems. For subscrip the resignator to open systems. For subscrip

2 Tonden

(a Texas Instrum 3 Unitys 3 Ventos Soli 3 Wang 3 Wallangon 3 Wyse

UNİSYS Unitys offers X/Open and POSIS-compl-on aphilians with connections to india by standard OSI networking environ ments. Mamber X/Open, OSF, UI. CON 1,800 and 1,904 See 189.

#Quarterdeck

(SEOUOIA)

Stratus

sun

The industry's lies and broader family of BGC broad Faulthforers SVE Systems off SPG2 broaded - for Critical Online

Dalvering true computing freedom with open classramer solutions reducing worksteins, servers and the SPARC/Solors agenting

CSYBASE

TANDEM

TEXAS INSTRUMENTS

open systems through multiplement stem-durds-compliant UNIX, POSIX, SQL, and

DESQuaw/X is the first full DOS clare/spray appropriates of the XWIn-dows System With DESQuaw/X, net-worked records on transporate occur-

Proven Open Systems expenses: larges socialed bose of featherings UHEX systems (systembolis to thousands of cours Tachnology edipated by assessment in the course in

FOCUS 459: Universal data account/star gration Open/Laptory systems EDA/SQL Clean/server termby SQL-bound accounts

74 INFORMIX

Ingres

1 \ 1 \ \//

III fecuses on GUI software for the Open Systems meries - in X desires o new the moster leading desires money and the feature of the Control
MNOVELL

Novell is a servery specified system setterm company, specified the Ware natural computing predicts for DOS, Mocintob. OS/2 and UNIX erro.

Olvett adultum bring Open System Stondards such as UNIX System V and OSI slover to the user Manhair X/Open, U.

ORACLE

PROGRESS

OSF

J Allos J Andol J Appla J BJI

Oracle supports oil major standards includ-ing X/Open, OSF, UNIX international, ANS, SQE Access Giren, IEEE, ISO, FIFS, and COMPANY ACCESS TO A STANDARD

olivetti

For high-performance dombose servers, best-selling application development envi-ronments, and endurer productivity best-days monogenees on open systems means

mplically screen developer productively office any magnetic, and mobile sendo-senue deployment ocrass haterspreamen

VINIAS Subsects in the booking supplier of reducts absoluted, additional absolute desirance most polysters and advisorie specific being DELL'STAILERS.

WANG Class/server-board adultions from the lead or or Office and languag technology. For advantation on our ESC board application

WOLLONGONG Walangang's halfWay navorking products give users of dealing computers occurs to computing manufacture and departmental

WYSE Providing scalable, true symmetric malapro-cessing UNES SYES & SYEA commercial systems, conforming to industry standards and combining high performance with

> XFROX The Document Company Providing into grated document management utilities on open platform, through advanced not working and the Distriction workstation and part 1-800-835-9013

As an independent considered system and later and integrator. PW provides a complete system price with printing open solutions within legacy order. Prime Service

port, power and provinced dispute recovery, one call, and contents about Publication COMPUTERWORLD

Words from the wise

Unix is not necessarily open.
"You can have an open system in
which this plays a minor part or a thire
system that inn't really open. Unix supcodes frequently offer unique endors frequently
offer unique endors
themselves from the rest of the pack.
That's not necessarily lead.
"But if you take advantage of the feaures to one weator's bins, your software

work if you move to another vendor's box that lacks these features.
You're locked into the first vendor, just as you would be with a proprietary system

ucts. You need a road map from where you are now to where you want to go.
"Prople affected by open systems should be involved in the process of defining open systems design principles or else any plan won't be long-lived. You can't imple-

ment open systems by ex-

Justifying may be tough

"Open systems are usually justified on the basis of reducing hardware costs and staff training. But open systems haven't yet evolved to the point where their fun-tionality and services are that much greater than whit you can get with proprietary sys-tems. Users won't buy off

on an open system u you can show the val added benefits an ent orise gains from bringing

be sure that the equipment you pick from different wenders can communi-cate using the protocols you want. Open systems place more responsibility on get-ting users the education they need."

Proof that Okidata's newest printer will get you



people who buy our new Pacemark 3410 to print on aluminum the thickness of a beverage can. But our demonstration rells you a lot about how negged Okidata's new dot matrix printer is - and how

well it'll handle your heavydury printing lead. Sharp, clear 8-part forms, for exam-ple, are no problem for a printhead that can handle metal sheets. And continuous

are a natural for a machine so reliable. a's been rated at 8000 hours VETBE But the all-new Pacemark

processing chore

3410 has more than muscle on its specsheet: speeds up to 550 CPS, built-in bur code fonts, and a full range of paperhandling options (top, bottom, and rear feed; labels, envelopes, heavy card We don't just design it to work. We design it to work wonders.

stock, etc.).

Plus one more impressive feature -the Okidata OK! Our pledge that Okidata printers will deliver performance and value that don't just meet your expectations, but surpass them.

So if you're looking for a reliable. heavy-duty printer for OK DP, multi-part forms. printing, see your Okidata dealer, Or

har code or network OK call 118001OKIDATA OKIDATA OK Open yourself up to some help

Several publications are available that provide information about the obstacles to open systems, standards that facilitate "openness" of applications and equipment and products that comply with those standards. Here's

Managing Open Systems, Finik-ner Information Services, Pennsauken, N.J. (800) 843-0460.

Open Systems Handbook, Digital Equip-ment Corp., Maynard, Mass. (508) 493-

Standards-Based Architectures, DMR Group, Inc., Boston (617) 237-0087. X/Open Portability Guide, X/Open Con-sortium Ltd., Menlo Park, Calif. (415) 323-7992.

TOOLS

A Selected Biography of Unix and X Books. Covers programming, security, system administration. O'Reilly & Asso-ciates, Inc., Sebastopol, Calif. (800) 338-Electronic Mail Demystified. Written for

nical and management-level uners in systems environments. UniForum, en systems environments. Uni nta Claro, Calif. (800) 255-5620

Managing Open Systems. Free report that shows how open systems work in the real world and how to protect your com-puting investment. Fauliner Information Services, Pennsauken, N.J. (800) 843-

CALFNDAR

The Interop '92 Spring Conference and Exhibition, Washington, D.C., May 18-22. Keynote speakers: Mitch Kapor, Dixon Doll. Contact Interop '92 at (415) 941-3399 or (800) INTEROP.

901-3399 or (2007) IT I ZEVET.

OpenForum '92, Utrecht, The Netherlands, Nov. 25-37. The conference will be sponsored by Uniforum, EurOpen, Reed Exhibition Cos. and Royal Dutch Fairs.

Call UniForum at (408) 986-8840.

DIGITAL FLIGHT 586 IS NOW BOARDING.





ipping is included. (Ask what hey charge.) Lifetime Technical port. 24-hour FAX Support And a 30-Day Money Back ee. And in the unlikely event something should ever go rong with a 400ST model or any personal computer from Desktop Direct **, you'll benefit from our no-fine-print On-Sire Service for one full year after urchase—at no additional charge. While every Digital

Noeebook comes with a One-Year Return-to-Factory Service Warranty, Telephone Support and red repairs. As well as our 30-Day Money Back Guarantee and a 24-hour FAX line!

DIGITAL'S UPGRA DABLE 400 We take you all the way

You wouldn't want to board a plane that can't take you where you need to go. So why buy a PC "upgradable" that can't go the distance? Only Digital has the technology and engineering expertise to land you safely in 586 territory today.

Thanks to our exemplary-and industry-standardupscalable Xpress EISA architecture, the 586 will fit every 400ST Series PC like they were made for each other.

After all, they were made for each other. While all those other "upgradables" will leave you waiting around for some add-on that hasn't been designed yet. Or emptyir "upgradable" PC altogeth

586 Why crash and I runs out of gast Our DECpc 450

50MHz proce can configure or a powerfu

where you want to go, the No matter which Dig customize your system wit and hard disk storage ran

852MB SCSI-or more. S state-of-the-art powerful color i



ST SERIES there.

g out and rebuilding their

urn with an upgradable that Soar with Xpress EISA today:

ST sets the pace with its i486dx, sor. And because Digital

it for you as a single user system network server, it can take you

way you want to get there. ital model you choose, we can

n memory from 4MB to 192MB ging from 105MB IDE to ix EISA Bus Master slots support

standard VGA monochrome to esolution of 1280 x 1024. And, of course, you can

Desktop Direct

have it with MS-DOS 5.0 and
Windows 3.1. So call us now
for availability.

Percines on PC and get a service teem of 10,000. When you buy from Deskcop Direct from Digital, you get the world's second largest computer company as co-pilor. 10,000 of us in fact. On staff, fully trained and ready to service

of us in fact. On staff, fully trained and ready to arrive with any equipment necessary We can even be there to help when you need training or special classes.

What's more, Digital's sacclaimed engineers are always available to help you navigate through all your information rechnology. Installation, systems integration, networking expertise—all together in one experienced, erhable crew. The way only Digital can do it.

FLIGHT DHECK Before you take off for SRG, check these features—all included by Desktop Direct at no extre charge!

check these features—all included by Deaktop Direct at no extra charge!

If 1 Year On-Site Service with No Fine Print

If Lifetime Technical Support

Support 30-Day Money Back Guarantee

Guarantee

24-hour FAX Support

Electronic Connection
for Electronic Ordering
Modern Information

Modern Informat Er Shipping

DLEAFED FOR TAKETER!

1-800 PC BY DEC

Please reference ANJ when you call. Mon-Fri 8:30am to 8:00pm (ET)

digital

DESKTOP DIRECT" FROM DIGITAL

The shortest route to big time savings!

DECpc 450ST

Intel® 486 running at 50MHz 4MR—remarkable in 192MB

105MB IDE 3.5" 1.44MB Floppy

3.5° 1.44MB Floppy 14" Monochrome Monitor (resolution 640 x 480) SVGA+ (supports up to 1024 x 768, 24 colors)

101-key enhanced keyboard 3-button mouse

MS-DOS 5.0 and MS-Windows 3.1 Includes: Shipping, One-year On-Site Service, Lifetime Technical Support, 24-hour FAX Support, 30-Day Moory Back, Guarantee

* *5,39

Selected Options: 852MB daik with high performance BISA SCSI Adaptors. 85 Main-speak WGA Color Mosters with Vade RAM upgrade to 11MB, add \$2,400. 8MB RAM (to 12MB), add \$400. 1.2MB 5.35 Feoppy Drive, add \$75 Mary other options available.

DECpc 433ST

Intel® 486 running at 55MHz
4MB—expendable to 192MB

3.5" 1.44MB Floppy 14" Monochrome Monistor (resolution 640 x 480)

SVGA+ (supports up to 1024 x 768, 24 colon) 101-key enhanced keyboard 3-button mouse

MS-DOS 5.0 and MS-Windows 3.1 Includes: Shipping, One-year On-Site Service, Lifetime Technical Support, 24-hour FAX Support, 30-Day Money Back Guarantee

*4,199

Selected Options: 852MB disk with high performance ESA SCSI Adapter, 16" Multi-sync VGA Coke Moustor with Video RAM augensle to 1MB, add 82,400 SMB RAM, add \$400. L2MB 5.25" Floppy Drive, add \$75, Many other precess available.

GET FOUR APPLICATIONS FREE

Why choose when you can have them all? You'll get all four of these popular applica FREE with any Deginal PC, Worksteinen, or Noorbook you purchase between now a June 30, 1997. Then value: \$798.00.

You'll have all the great Lorus 1-2-3 spreadsheer features and then some with easily easy-to-see graphs: capabilities for addition couldness over a contract.

> cente pro-quality presentations on sper, 35mm slides and overheads.

peare pro-quality presentations on sper, 35mm slides and overheads. Over 1,000 pec-drawn symbols and ackgrounds serioslot?) All the suscisse PC World Best Buy. PC Edirer's Choice. Software Digest Highest Evaluation. Need we say more? This is one ulers deluse word processing program!

num?

B occident Para Manageme

I Magazine 1991 Product of the
Lets you share 1-2-3, Freelance,
Pro Pites—and send and stoome

Ame Pro Piles—and send send send E-mail. You'lt love st

Desktop Direct Digital

1-800 PC BY DEC

Please reference ANJ when you call. Mon-Fri 8:30am to 8:00om (ET)

digital

Only Digital flies you non-stop.



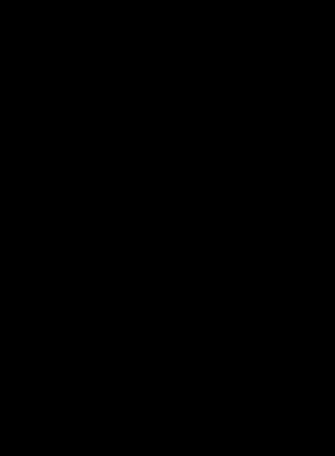
and we'll send you a special system recommendation. (Or call 1-800-722-9332 and we'll recommend by phone!)

Your Name		Which of these graphics-orien (Check all that apply)	red applacements best describes your needs?
		Deskrop Publishers	☐ Image Processing
Tirk		CADICAN	□ AnnCel
1.	, .	☐ Regitime Modelana	Bouness Graphics
Company Nume		- Assessor	D south trights
		How many people work in no	or group, department or small business?
Address		Less than 10	□ 20-55
		□ 10-20	☐ More
Coy	Scare Zop	- Is your desktop opening syst	
		□ DOS	□UNIX**
Your Telephone No	Your FAX No	DD6 with Windows	. □ VMS
		□05/2	Other
		□ MAC	
Contact me regard	HOME BUSINESS RESALE	LAN Communicat	
DECpc (48% and (48%) better		From how many manufacturers	
DECpc 1586 and 1586ex based	Haxes — — —	What kinds of consections do	is your PC(s) require tCheck all that arely
The DECpc 320P Nonebook		Links with other PGs in the	unmediate surroundings
The Desktop Direct Catalog		Connection to the local area	nerwork (LAN) throughout a building
Choosing the right		A lase to a host system in a	
			is used in your LANs roday?
	_486OtherNor Sure	What is the networking so	tweet now bring used an year company!
	PCss run in a typical workday?		
	purchasing ever the near 12 months'	Dupted DIBM DC	vill your PC communicate with?
Are you'reserved in leasing"			ţ***
	rds 3-6 months 6-12 months		rice Do You Really Need?
	rock the system will be used for	On-see Handware Support	☐ Tenning
Check all that apply)	n	Software Support	☐ FAX Horizon
Wood Processing	☐ Education	· Telephone Support	
Onder-entry	Design (CAD/CAN)	How many of your users take	
Database (filing records)	☐ Eaguierrag		e contractio for your PGs? How Many?_
Francoil Calculations	☐ Industrial Process Control	Does your service provides offe	r Malowendor support ' ☐ Yes ☐ No
Retail Score Management	Scientific Research		
Desktop Publishing	Survay Development		
Other unlawny-specific applicat	ion E-Mad		



see reference ANJ when you call. Mon-Fri 8:30am to 8:00pm (ET)

digital



Announcing the 1992 Computerworld "Object Application Awards"

Think your objects look pretty good? Then show them off by entering Computerworld's Object-oriented Application Awards Competition.

Object-oriented technology.

It's on the cutting edge and Computerworld's Object Application Awards showcase those individuals bold enough to develop the applications for it. The winners will be announced at the Sheraton Palace Hotel in San Francisco on Tuesday, July 21 (during the Object World '92 show, July 21-23).

Call today for entry.

Your entry should be an internally developed custom application currently in use (not a prototype) and not for resale. It should be either an entirely new application, a modification of an off-the-shelf application, or a object-based, front-end for a host application.

This object will be awarded for each of these five object-oriented applications.

1. Best implementation of a distributed application using object-oriented tools. 2. Best implementation of a "reusable" development environment for company deployment.

3. Best "object-based" application developed using NON object-oriented tools. 4. Best "cost-saving" implementation

using an object approach.

5. Best use of object technology within an enterprise or large systems environment.

To request your official entry kit*, call or fax: William Hoffman

Computerworld's Object Application Awards c/o Object Management Group 492 Old Connecticut Path

Framingham, MA 01701 Telephone: (508) 820-4300 FAX: (508) 820-4303

DEADLINE FOR ENTRIES IS

MIDNIGHT (EST), MAY 29, 1992







Network tall buildings in a

With Chipcom's ONline" System Concentrator you can connect a tall building or a far-flung campus with a seamless, unified and totally reliable network. A network that is truly self-healing, and capable of surviving multiple faults, from broken cable to failed modules or power supplies.

The ONline Concentrator is an intelligent wiring hub that handles all media, including coax, fiber and twisted pair. Its TriChannel" architecture lets you configure up to three networks on each hub in any combination of Ethernet, Token Ring

Other network management systems merely allow you to perform an autopsy after your network has died. Chipcom's

new Network Control System does much more: It provides instant CPR to keep your network alive by automatically rerouting itself around a failed component. And it lets you reassign, balance and reconfigure without setting foot in a wiring closet.

Using Chipcom's ONline System Concentrator as your network platform, you can build a network with the reliability, flexibility and manageability necessary to take it into

the 21st Century. And just think what a super hero that will make you.

BECOME A HERO.

n how to conquer the major causes of network res. For your free copy call 1-800-228-9930. GSA# GSCOK90AGS5185





CHIPCOM

Plugged in

Laptop work is only meaningful for business users if they can integrate it with desktop work. Here's one vision for meshing the two environments.

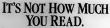
BY ANNE S. KELLERMAN AND PALMER W. AGNEW





- · Comfort settings: Size, weight, memory, etc.
 - What laptops will look like by '98
 - · Pros and cons of connection options





You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of Computerworld. As the only weekly newspaper for IS professionals, Computerworld

as use outly weexly newspaper for 15 processionals, Computerworld is filled with up-to-the-minute articles on topics ranging from products and people to trends and technology. We cover it all—PCs, workstations, mainframes, client/server computing, networking, communications, open systems, languages, industry news, and more.

It's everything you need to know to get an edge on the competition.

That's why over 135,000 IS professionals pay to subscribe to Computerworld every week. Shouldn't you?



IT'S WHAT YOU READ.

Order Computerworld and you'll receive 51 information-packed issues. Plus, you'll receive our special bonus publication, The Premier 100, an annual profile of the leading companies using information systems technology.

Call us toll-free at 1-800-543-1300. Or use the postage-paid subscription card bound into this issue. And get your own copy of Combuterworld.

Then you can spend less time reading about the world of information systems. And more time conquering it.



The Newspaper of IS

COLP THE T	AR M COM OF TROUGH MS DERITHE M SHE M SSLE OF CONTINUEDS

YES, I want to receive my own copy of COMPUTERWOR accept your offer of \$38.95° per year — a savings of \$5 ubscription price.	LD each week. 00 off the basic

Name	ч	-	,	Leet Name			
	 ,		-	Concery	_		
	 				_		
	 _		_	Sale	-	Σφ	

COMPUTERWORLD



YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$36.95" per year — a savings of \$9.00 off the basic

subscription (же.		
First Name		Last Name	
Title		Concerny	,
Address		**	

COMPUTERWORLD



E Country - Description



BUSINESS REPLY MAIL
PRIST CLASS MAIL PERMIT NO. 55 MARION, OH 4350
POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044 Marion, Ohio 43306-4144

lalaalaallaallaaallaaallaaallalaallalaallal





BUSINESS REPLY MAIL FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 4330

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044 Marion, Ohio 43306-4144

metho lipsys, dealings and ween hore com-mission. Statement of the desired with a desired the ensemble properties to an through the enseme, predictive and enterpt the enseme, predictive and through the enseme, predictive and through the enseme and ensemble as it of lapson and dealings likes. Here there is a connected to the enter it dealings companion, or even to a need to surge contribution large and dealings and distance that the state of the contribution of the contribution in the dealings and dealings and the contribution of the contr

psystems there.
While personal organizer programs,
thich are intended to run on leptops,
me with programs that merge such files
th files used on the same or different
ograms on deaktop computers, compaes need a program to invoke the merge

HE USE OF laptops in business is severely limited by a general lack of easy-to-use hardware and software for connecting laptops to other machines.

stirs of hies to merged, along h where the files are located on the lap-and dealtop. For each such pair of a, the index file would sho specify the me of the application program that per-side merces. inter date as a laptop file.

In practice, this function nee transfer activare on both the lapt the dealton and also needs a progrativokes the file transfers.

Third, particular files on the d

rms the merges. The uner need not name the applica-

Furnishing data

in the next six years, the laptop is expected to es-eate a PICA, or personal information communic appliance, a powerful, easylo are computer emi-in furniture, mirrors or wherever the user wan Resembles a paperback book in size, weight and readab

Chord keyboards, in which users press a few large buttons in combina for each letter, could reduce keyboard size.

Contains software for accessing and maintaining an inter-built-in speaker. Provides telecom access to users' private data as well as access to p data, integrated voice mail and electronic mail.

Communicates over high-speed fiber and other networks Has detachable CB-ROM drive. User could load the unit of a back into the PICA's memory and diven remove the device while rending the back, without carrying or powering the drive.

Partial page scanner built into one edge and an opti

Provides apeech, audio and music input and output as well as a built-in video camera for scanning text and recording scenery. By 1998, size will shring so wallet size.

Personal experiences

Impact of Management & Technology

room full of infraredcomputers, desktop computers, printers, fax machines and scanners and his laptop would "see" these other devices.

USER COULD enter a

FREE BROCHLIRE AVAILABLE

What you ought to know before buying that thick wire

ular cable):
Advantages
6% of the weigh
60% of the cost.
More flexible.

FIBER-OPTIC CABLE (plastic fil with LED transmitter):

Type of connection	Weight per 10 ft	Price per 10 ft	Price, hard- wore per end	
Thick copper, printer cobie	23 or.	87	860	400K
Thin capper phone mod- ular cable	1.4 oz.	84 -	\$60	64K
Low-end fiber ophs	0.5 or.	83.05	860	100M
Wireless infrored	0 cas.	80	8300	256K
Wireless	0 ca.	90	8495	242K



WE CAN SHOW YOU A CLEAR PATH FROM CICS TO THE AS/400. INTRODUCING KIKS400-THE

AUTOMATED MIGRATION UTILITY



Open VMSTN is the definition of no-compromise computing. No compromise in that you get everything you want in a sys-

tem without having to make sacrifices. Price es Performance

Open VMS has always been

known for its versatility, its dependabili ity. But what about speed? Well, the pernce of Open VMS actually exceeds the fastest RISC

systems. That's based on real-life applications

And this performance doesn't come at a high cost. In fact, using the same audited benchmarks,

Open VMS price/performance bails even RISC.



Open VMS delivers better price/performance than even the

with all popular desktops, all popular lar large systems, and all popular databases.

OPEN VMS.

fastest RISC UNIX's systems from IBMTM and HPTM

Functionality

Open VMS is the most func-onal computer available today. It has the easiesttouse software, the best development tools, and over 10,000 applications. It can eas-ily grow from desktops to datacen-ters networked globally. And it's the

best at protecting your data and making sure it's always there. All of which is why over 10 million people today rely on Open VMS for their business-critical applications.

Open VMS is what its name implies open. Because built right into it is the most comprehensive set of

industry interface standards, our Network Application Support (NAS) software. This enables multi-vendor computing Tomorrow

Open VMS is the ideal sys tem for running your busines day, and it leads the way to the future. Since it is so o

Open VMS gives you a clear path to Alpha, the computing architecture of the 21st century. With today's Alpha-ready Open VMS

systems, you can enjoy the best solution today, and you in the best

architecture

Since Open VMS is from Digital, it's backed by a worldwide service

path to the future, and

support - no-compromise computing define Formoreinformation

on Open VMS, contact your local Digital

DIGITAL.

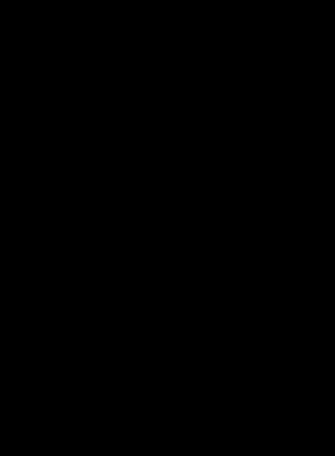
Where are you headed with your applications development?

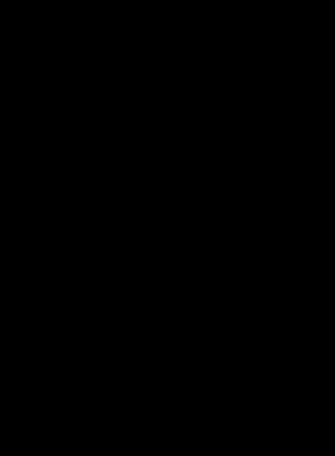
1 ACTIMAN Model Driven
Dearly prisent puts you on
the git course for increased



avela at from a walti in seldev is

BACHMAN





MANAGER'S JOURNAL

EXECUTIVE TRACK



e Service, has been

nce 1989, Decker had been assistant regional com-missioner for data process-ing for the Mid-Atlantic re-gion, based in Philadelphia. In her new position, she will be responsible for all taxoaver service programs.

Decker joined the IRS in 1981 as a public affairs office

at the Cincinnati Service Center. She became chief of the processing division at the Philadelphia Service Cen-ter in 1985 and assistant di-rector of the Service Center

in Ogden, Utah, in 1988. She holds a bachelor's and a master's degree as well as a Ph.D. from Indiana Uni-

The IRS also promoted Walter H. Irvine to director of the telecommunica-Irvine will be rest

for planning and implement-ing the IRS telecommuni-tions voice, image, text and data. He joined the IRS in 1989 as sistant director of the tele-mmunications division. He entered the federal

ect manager for the General Services Administration's (GSA) huge Federal Telemications System 2000 communications con-tract. He later became direc-tor of the GSA's telecom-

rine holds a bachelor's e from Williams College hamstown, Mass. rt J. Loeb was na

tor of management in-ation services for Will nty in Joliet, Ill. Loeb previously headed bert J. Loeb Management insultants, a Chicago-led consulting firm. He the University of Ill hicago and an MBA f sity of Chicago.

Coral lipstick? It sells big in Florida

Quick crunching of point-of-sale, merchandiser reports vital to marketing decisions

INDUSTRY CLOSE-UP IS in the

Personal Care Industry

BY JULIA KING

merican consumers tend to buy new toothbrushes only when they see hundreds of them in special supermarket displays. Midwesterners prefer their shampoo in big bottles, but men and women on the East Coast consistently buy toiletries in smaller sizes. Coral shades of lipstick sell better in Florida than in the Northeast.

A decade ago, it would have taken ouths and hundreds of market remouths and hundreds of market re-searchers to pinpoint trends such as these. Today, buying patterns can be identified in a matter of days, thanks to the oceans of data now available from retailers' electronic point of-sale (POS) systems and portable systems used by sales reps and merchandisers. Manufacturers say the addition of frequent reports from merchandisers is

request reports from merchandssers is a critical step because they indicate not only what is selling but why — some-thing POS data alone does not do. In the \$9 billion personal care induspatterns makes or breaks its bottom patterns makes or breaks its bottom line. That's why many companies are automating the way they track and ana-lyze retail sales data, which in turn is driving promotional programs for ev-erything from soap to shaving cream.

rigin-recti nomework Cincinnst-based Procter & Gamble Co. (P&G) — through the use of some homogrown systems as well as Meta-phor Computer Systems, Inc. databa-software, Toshiba Corp. portables and

a Teradata Corp. database system — collects and analyzes retail sales data, says Frank Caccamo, P&G's chief inermation officer. This information is hen used by marketing to target spe-

and consumer data, P&G was able to spoint older women as the most loyal stomers of the company's Oil of Olay oduct line, Caccomo says. To attract w buyers, P&G isunched an advertisg campaign geared specificary to enagers and young women.

Thanks to daily reports sent to adquarters by laptop-toting sales-ople, P&G's marketing unit can also w see the effects of pricing and mar-tical marketing and mar-

tems four years ago, it received es data from A. C. Nielsen Corp. and ormation Resources, Inc. every two

months. Now, "we get all of the data for any given week at the end of that week," Coccamion says. Intrinsibes in-the recking system disperses, the coccamion says. "In the hope with the coccamion says." It helps us to better under-stand regional differences in buying hists," he says, (it was PAG, in fact, that established Midwesterners' pref-rence for jumbo sizes.) To maniple, Daving the past visitor, retail data in conjunction with regional weather par-colunction with regional weather par-

terns to measure how weather effect sales of its Vick's Formula 44 and Ny

CIOs find balance at Andersen seminar

BY NELL MARGOLIS

Coral lipstick? Big in Florida

CONTINUED PRIOR MICE 117
CONTINUED PRIOR MICE 117
COUNTY TO CONTINUE PRIOR MICE 117
COUNTY TO CO

information and technology.

The Gillette Co. in Boston is piloting a system that will do away with paper-based reports. Under the program, Gillette merchandisers — company employees who maintain store displays — file daily display patins reserve minor College.

ily display status reports using Grid stems Corp. portable pen-based com-Systems Corp. portable pen-based com-puters that run software from Atlanta-based Sales Technologies, Inc. A mer-chandiser's report, for instance, can note that sales of a certain brand of shampoo or bath oil are particularly brisk at stores where special displays have been erected or where coupons are available. This data is given to account manag-ers, who can set merchandissing and pro-motional objectives based on specific ac-counts. Objectives may include setting up

courts. Objectives may include setting up more display or changing display items.

"These objectives used to be typed up by managers, sent to a central office and mailed to all merchandisers, who would then file them in their fistlers with all of their other papers," says Ted-Standischer of information systems in director or information systems in director or information systems for the standard or the standard

For example, managers would some times fail to set objectives, so merchandis-ers would not have the information they needed to do their jobs. "Most important-ly," Standish says, "Gillette didn't have information about the execution and e fects of our display programs." The cor-pany wouldn't find out if a display ha been set up and was effective until long at

been set up and was effective until long af-ter a promotion was over, he says.

Now, by contrast, Standish says, the data that previously took 6 to 12 weeks to get back is transmitted by merchandisers nightly and is available to account manag-ers on a weekly basis.

ufacturers agree that organic

ages are necessary if the new as ed methods are to yield true benefit While data in itself is incredibly p "While data in itself as incredibly pow-erful, an organization must be set up to re-spond to that data in a timely fashion; notes Dan Bartbolomev, a manager at CSC Partners, a Philadelphia-based con-sulting firm. "There is a whole raft of de-cision-making that must take place very quickly," Bartbolomew says. "As a result, teams must have the latitude to mobilize



ne by creating E point around 1000 years on years and the best hand less described by the second of
The First Informix **Worldwide User** Conference San Jose, CA

The conference will offer

four tracks: Development

Tools, Engines & Servers, Applications & Ventical

Markets, and Management Some of the presentation

INFORMIX-SQL Trps & Techniques

•Informix Connectivity

*Benchmarking INFORMIX-Onlane *CASE Vendor Panel

OLTP for Managers

INFORMIX-Onlane

*Wingz" 2.0

July 8-10, 1992

here are a lot of good things happening at Informix. New products, new programs, and a bold new atti-

tude. It's called success. And we'd like to share it all with you. Announcing the first Informix Worldwide User Conferencethree days of presentations, demonstrations, exhibits, and more.

cŧ	rmbers—including Roger Stepti, Informix's founder and airman, and Phil White, president and CEO—will be on nd to show you what all the excitement's about.
	Detach and mail or fax in this coupon to register for IWLC 92
1	Name
4	Adrimu

- Full conference attender (\$795 pre-registered)

 Eaksives only (free if sign up in advance, \$25 at
- ☐ 1 am bringing a team (d 4 people from the some company all regular together, one comes free) ☐ Tunorials (\$199 with full conference registration, \$299

Don't miss the 50,000

square foot show floor, where over 100 VARs, OFMs and InSync partn will exhibit the latest in Informux third party software and application solu

Be part of our success come share the excisement at the Informix Worldwide User Conference '92—July 8-10 in San lose, Cable it's easy to register Just fill out and mail or fax the entry form to the left.

*Applications for International Markets

For an additional charge, we're featuring a full day of technical tutorials July 7, the day before the conference begins. The tutornals will cover a number of top-ics, from HyperScript* pro

Nolan, Norton yardstick shows IS where it stands

BY NELL MARGOLIS

LEXINGTON, Mass.— Information sys ms departments in search of increased ectiveness and efficiency should heed e example of former New York City the example of tormer new som one Mayor Ed Koch, according to manage-ment consulting firm Notan, Norton & Co.; At every opportunity ask, "How'm I

in: "
Nolan, Norton's Detabase Ceme;
aseline Program attempts to answer
att question by measuring and analyzing
annual changes in IS demographics, work
ands, service levels and technology costs.

CALENDAR

WANT QUICK ACCESS TO

PRODUCTS?

See Computerworld's Product Showcase

Page 131

1992 AIIM SHOW & CONFERENCE

AIIM

Your Imaging Connection

The world's largest, most comprehensive imaging event. The high point on the industry's annual calendar. At the AHM Show and Conference, more new ima products are announced than during the entire remainder of the year.

Discover effective ways to capture, access, and process document images Evaluate the range of technology options that can transform your business.

- Electronic Imaging Systems
 CAR, COM, and standalone micrographic technologies
 CD-ROM and Multimedia
- Optical and intelligent character
 - recognition

- Document Management Software
 Consulting and Service Companies
 Systems Integration and Technology
- Interfacing

More than 300 Show exhibitors invite you to see and compare. Over 80 Conference sessions will inform the imaging novice as well as the expert. The AIIM Show and Conference. Make your imaging connection here.

The 1992 AIIM Show, June 23-25 The 1992 AIIM Conference, June 22-25 Anaheim Convention Center Anaheim, California

Free Admittance to the AIIM Show - Save \$20 Yes, I want to attend the 1992 AllM Show. Ple register me today. My badge will be mailed in advance if I register by May 8.

Yes, I want to learn more. Please rush me a full AIIM Show and Conference brochure.

SEND TO: AIIM Meetings Department 1100 Wayne Avenue, Silver Spring, MD 20910-5699 Show & Conference Hotline 301/567-8302 Show & Conference Fax 301/508-2446

Name	
Tale	
Company	
Address	
City,Nate,Zip	
Country (if foreign)	Phone

MAY 11, 1992

A Chair The E

Better Service, Better Support, In Response To Rapidly Changing

WHEN CLIENTS SPEAK, WE LISTEN.

And lately we've been hearing a lot.

About tight, tight budgets and the critical need for investment protection. About new plans for client-server technology and distributed processing. About emerging platforms, portability and

enterprise-wide integration.

And even about your many frustrations with Architecture some of the things most software companies do.

or don't do.

FROM TOP TO BOTTOM, OUR ENTIRE
CLIENT SERVICE ORGANIZATION HAS
BEEN RESTRUCTURED.

And you know something? We agree. With just about everything you said. Good and bad. The best part is, we're doing something about it. We're replacing our Account Managers with a dedicated CA Service Team comprised of a Client Service Representative and a Technical Service Representative which will cat as a single point of contact for each client. The Team will have no direct sales role, so they can focus solely on giving you better client service and technical support.

WE'VE ELIMINATED MANY RESTRICTIONS AND HIGHLY-COMPLICATED PRICING ARRANGEMENTS.

The Client Service Representative will manage the relationship and make sure that all of your needs are met. The Technical Service Representative will act as a "techie on-site" and identify and solve any and all technical problems.

For specific product expertise and support, we've assigned hundreds of marketing specialists, product consultants and systems engineers to product specialty groups.

nge For etter.

Better Prices, Better Quality. Client Needs, We're Changing, Too.

including Systems. Information Management, Application Development, Business Applications, Mid-Range and Micro software. We're also doubling the number of our Client Base Administrators, quadrupling the staff in our National Accounts area, and upgrading training and continuing education within the company and across the board.

NEW SPECIAL NON-TIERED PRICING, MAINTENANCE FREEZES, UPGRADE SAVINGS, RIGHT-SIZING CREDITS AND ENTERPRISE LICENSE PLANS.

EN I ENFINDS LICENSE PLANS.

We took virtually all of your suggestions regarding pricing and maintenance and put them into practice. We're introducing a range of simpler, fairer, more affordable programs that give you the freedom to choose what's right for you. One plan can reduce your maintenance by as much as 40% per year. With CA90, Computing Architecture for the 90s, we

can keep pace with your needs because it helps us develop software in a faction of the time it weed to take. That's why we're leading the way into all of the emerging new platforms, including UNIX, AS/400, VSE/ESA, Windows and CS/Z, with the broadlest range of proven, portable software solutions in the world. From maintiframe to mid-range to micro computers and you know that we have more Windows products than Microsoft?—we have all the software you need. And we develop, licrose, service and support it just the way you want.

> FOR MORE INFORMATION, DIAL 1-800-CALL CAL

Call today and we'll fill you in on all the changes. And keep telling us what you want.

elling us what you want.
As you can see, we're pen to suggestions.

ASSOCIATES

of the control of the co

O Computer Associates international, inc., One Computer Associates Plaza, Islandsa, NY 11788-7000
All product names referenced herein are trademarks of their respective communics.

COMPUTER CAREERS

The private bookshelves of IS managers



ne on Earth that most is jecu-id go for sound management but the book, by Roland Hust-deceum, 1985), was "the best ement book I ever read, "ays-fucco, senior vice president of CI Communications Corp. in





s out to some executives.

te title refers to what the author
"westerns thinking" — that indi-



vidual learning doesn't contribute to the organization as a whole and that companies must become "learning organizations" to stay abead. "It's not a cookbook," says Tom fiden, vice president of business in-formation services at Helene Curtis. Industries: Industries which is

stries, Inc. in Chicago, which is ing with Senge's consulting "The ideas are broad and in-

sightful.*

For instance, Senge writes about the "seven learning disabilities" that every organization faces, including the parable of the boiled frog. As the story goes, if you put a frog in bours are goes in the parable of the boiled frog. As the story goes, if you put a frog in bours goes in the same and slowly bring just to a boil, the frog will get cooked because it doesn't notice the heat of the water gradually increasing.

In the same way, fifthe things hap-

gradually increasing.

In the same way, little things happen in IS on a day-to-day basis that may oot get notice but that ultimate-thy lead to the success or failure of the business, Gilden explains. "In IS, this book has helped us get a good start on our total quality management pro-



ically dispersed usams as you as assume projects concurrently:

"The book also has had influence with respect to delivering our own is ternal software to users more rapid!

Our software development people as now more inclined to make full use the tools and methodologies available to them, "Sutter says.

15. managers are also readin



books that will help keep them and their departments on the cutting redge. For instance, Bob Martin, exe-tories are the second of Sa Wal-Mart Stores, Inc. in Bentseville, Ark, has not up to swall by applying what he learned from reading The Castome Driven Company by Richard Whitely (Addisson-Wesley Publishing Co., 1991). The book outlines a customer-



Moving on can mean moving up

This week's guest adviser is Steve B. Fogle, regional director at the San Francisco office of the Alexander Group, a Houston-

rack in applications devel-pment and have received sumerous calls from execu-ive search firms as well as eers asking me to make a ob change. In these uncer-ain times, should I make a

A Sometimes we don't pro-gress to the next manage-ment position or the next com-

ment position or the next com-pensation leted unless we make z job change. Although I recognize job excurity a being very impor-tant, sometimes a job more is the only way to continue to be chall-lenged and stimulated. When thinking about a job change, consider the company's performance (8 a public company, check with your stock anal-yst), the industry's performance and the history of the department. you will be joining. Ask for com-pany references such as custom-

pany reterences such as customers and former employees.

I would also recommend that you meet with someone in a department outside of information systems, such as marketing, asles or manufacturing, to learn as much about the company as marketing.

Q My background consists entirely of 1BM main-

CAREER ADVICE

FOR THE '90s

IDEAL or COBOL/DL P/A's DATACOM DBA's IDEAL DEV'T PROJECT LEADERS

TECHNICAL ANALYSTS/DESIGNERS
 PC-DATACOM or DB-STAR

d a new o

nals or newspapers to find out about other training programs of-fered by community colleges, adult education education progra ored by local firms.

TIPE MONTH

What do you do when you've been asked to work on a project that's badly conceived?



people are not threatened by our input; they usual to the ability to spot and fix problems up front. It do whose ego is at stake. If something's awrong, we fix Timothy A. Renney, independent cons

Compiled by Jill Vitiello, a speech and free-lance writer be in East Brunswick, N. J.

WANG NETVIEW NCP CICS DMS1100 ORACLE

VMS, C CLIPPER

C, 08/2, PM N DB2 CICS X.400 SNA T OS/2 LAN



INSTALL & SUPPORT SERVERS ON LAN SQL*FORMS DEVELOPMENT DISTRIBUTED DB DESIGN & AD

 EXECUTIVE INFORMATION SYSTEMS * PERFORMANCE TUNING

er evallable at every skill level including DBA's, sentor and regrammer analysts, and bands-on Project Managers to be at the our continuing expansion.

toestrox of our continuing expansion.

Join our saff of heavity and salaried consults programmers in the support of major corporate clis U.S. Call, med or faz your resume to:

Catherine Parodi at OMNItoch, Racitan Plaza I, Edit Phone: 500:7225-5577

Fax: 2008/225-0032





THE

IME DB/DC, DB2/CICS, TELON, IEF, FOCUS, APS RACLE &.Q. SYBASE, IMFORMIX, C/URIX, OS/2, PM MAD. FDL HOGAN, DIS. ASADE, PARALLE, PROCESS

COMPUTER CAREERS

FLORIDA SPECIALISTS

APPLICATIONS PROGRAMS CICS / DB2 MS DB / DC IDMS / ADSO AS400 RFG 400

TANDEM APPLICATION AND COMMUNICATIONS COBOL/PATHWAY C/SQL TACL/TAL

JENT SERVER TECHNOLOGY

COTTRATTERPEDRA E



AMD

SAGE CONSULTING SERVICES 2050 North Loop West, Suite 201 all 713/956-9400 or FAX: 713/956-7172 LIFE INSURANCE CONSULTANTS!

Other opportunities also available! ICS CONSULTING SERVICES INC. 2050 North Loop Wins, Suite 201 Houston, Texas 77918 Call: 713/954-9400 or FAX: 713/954-7172

CONCL.C SOLK 25

resume or call to also preser pools. We much

...Our recruitment advertisements in Computerworld cost less than in other newspapers and produce higher quality responses."

For almost 10 years, Devan Consulting has been staffing large data-processing shaps in the Philodelphia area with sub-procry high-tech programming professionate - programmers, sub-histoil writings and DP specialists. President Joel Adom knows their recruitment message must reach the most gradilled audience avail adventises in Computerword's adventises in Computerword's adventises in Computerword's

s we began to expand outside the im-date area...our need to reach a wide hincia base greva swell. Unlike our vertisements in Sunday editions of loca trapplian newspapers, our recruitment vertising in Computerworld draws qual d candidates...from all around the dd. Clearly, our recruitment advertise-ns in Computerworld cast less than in er newspapers and produce higher labs rescovers.

Computerworld. Whether you use computers, make computers, or sell compute products and services, Computerworld can help you recruit the experienced prifessionals your business demonds. For a the locts, call John Carrigan, Vice President/Classified Aventing, and 80/343-6474 in MA, 508/879-000.

COMPUTERWORLD



PACBASE

COMPUTERWORLE

MAY 11, 199

This Space for HIRE! CALL:

800-343-6474

Hiring Managers

DEVON CONSULTING





Registry

The

CONSULTING OPPORTUNITIES





THE COMPUTER MERCHANT, LTD.

Trade Association President

COMPUTER CAREERS MID-WEST

SOFTWARE DEVELOPMENT PROFESSIONALS Cuter Williams, Ite., a national information management services company, has accounted by professional services companied to a Posterio 620 company has not in St. Lows, AGO, Positions and residuation in St. Lows, Change, Delite and Tallabaser for the Company of the Comp

4 DB2/DK5 DC 4 DB2/CK5 4 DB2/CK5 4 DB3/BW/ADW

IEF/IEW/ADW
 MICROFOCUS COBOL

 Cutler/William a competitive compensation plan and a compethosaive fits peckage. Call or send resones so:

Corporate Recruiting
Cutlers/Williams, Inc.
558 N. New Ballan Road, Suite 101
St. Louis, Missouri 83141
6310 994-9966
G310 994-9966
BAY (530 994-9966

PAX (310 309-6309)
CUTLER/WILLIAMS
Information Management Services

Safe Service Inc. n a New York Seek Lechange company, is a special and interest and

DIRECTOR MIS'

Manager an 5 department of 40° Monit be hards on weltened terminding of general launceins and management protices services design and applications projectioning selfcines are selfconstructed foother and applications projectioning selfconstructed foother of empowersement or Catagong assets and
solid in a referencement or a fault of annual and
solid in a referencement or a fault of annual and
ord out of departments in a fault once environment of
the ord out of departments in a fault once environment of
the order of the order of the order of the order

The order of the order of the order of the order of the order

The order of the order of the order of the order of the order

The order of the order of

DATA BASE ADMINISTRATOR
spoonable for the dange, mantercarry and creams of its
a been and data decisions. Wild arrains and develop dat
a specification. Enquires a manual of the year agree
a with nation design indomation provided technique.

PROGRAMMERS

OF YOUR CHEMICAL STREET, SAN COLORS AND NOTICE STREET, SAN COLORS AND SAN COLORS AN

PROJECT COORDINATOR/ PROGRAMMER

ware int processing and the manipulation expensive; proloved selected for a compretive value and geneons benefit. All secretals candidates will be required to comprise a betagrand check and possibly a drug screen selected and providing selected for the processing selected and processing selected processing selected and possibly a drug screen selected and providing selected and possibly a drug screen selected and possibly and provided processing selected and processing selected

for your resume to (307) 771-274 SefeCard Services, Inc. 2001 Pershing Sind.

SENIOR INFORMATION

Challenger resourcible popular discript and concluding MRI review of information rygians protects is ensure their concessory, with strategy control and protects in ensure their concessory, with strategy concessor and protections. Exclude an exposure to all appears of their management of their way as exposure to all appears of protections and exposure and protection of the Coly of the Col

the have multiple appending freegate the beauth Proper Lutter and Late October Ingland.

DB2

Permanent and oppositing opposituation. Offices to Rept enter and Sympositiff. Cast on the pour opposition to contribute SOE April Computer Systems for April Computer Systems for April Contribut Systems South And American Control of the Control



Computer Consulting Group Contract Footseasure Service 4100 May a Footse Foot

The second beams of the se

Attention:

Hiring Managers

pare costs and the people reached, Computerworld is the best newspaper for recruiting qualified computer profession ols. Place your cuts tradeul

Call toll-free Now you can access Computerworld's new Careers On-line bulletin board!

Just dial 508 879-4700 with your computer and modem and you can access the most upto-date computer job listings available!

COMPUTERWORLD



COMPUTER CAREERS MID-WEST

Total State of the Parket of t

SYSTEMS PROFESSIONALS ipe to loise !!!

OCS ORACLE FOOLS and PLY

HP 3000 will IMAGE, POWERHOUSE, IN CORD. PLEASE SEND US YOUR RESUM

of the following: • Oracle 6.0 CA1.3
 Pro Lond. Perchana
 Motif on VMS
 AS/400

* C++/Wi Catia/Cadam
 IDMS/ADSO

TEAM

Programmer/Analysts

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

Computerworld reaches more highly skilled com-puter professionals than any other newspaper or magazine - Sunday, daily, or trade.

629,204 of them to be exact. And this autience is even verified by the Autir Bureau of Circulations (ABC), the largest independent auditor of publica-tion circulations. And from JCL to Unix profession-als, DEC VAX to IBM PC professionals, these job candidates have the skills your company needs.

Some Key Skills of Computerworld's Readers

Herdware	IBM PC Competible DEC VAX	\$23,573 185,804 443,166 316,774	
Languages/ Utilises	Cobel JCL		
Operating Systems	MSA CICS	102,580 247,636	
Detabases	DES VSAM	112,199 179,767	
Communications	DECreat Ethernel	96,000 203,060	
Local Area Networks (LANe)	Novell Token Ring	225,100 114,200	

CE: Skill Survey of Commisments's Audience, Jone 1991.

Call for a copy of our Skill Survey.

To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

COMPUTERWORLD
Where the qualified conditates look. Every week.



-

COMPUTER CAREERS



The Insulan Citizens
PRODUCT CONTROL STREET AND TOTAL PRODUCTIONS AND TOTAL PRODUCT
IN Addition to relevant supervisors in the above specific to produce what have a private high and to addition to relevant supervisors in the above specific to applications and confidence and public to additional and the above supervisors and to additional and the above services are also services and the above services and the above services are also services are also services and the above s

NFORMATION NAVAGEMENT RESOURCES, INC.
26750 U.S. Haymay 16 North, Sults 500
Charmeter, Tt. 34621-3442

Reportes .	Fac: (813) 791 4152	
STERM ANALYST for Com- panie Committy From to case in the Ching What you could be the Ching What you could be the controlled and the com- panies of the companies of the controlled and the companies of the property of the companies of the property of the companies of the companies of the companies of the property of the companies of the companies of the companies of the companies of the companies of the for all digits a married or property companies of the companies of the for all digits a married of the for all the companies of the companies of the companies of the companies of the form of the companies of the companies of the companies of the companies of the companies of the companies of the	WE'RE HOTE WE'RE HOTE WATER TO THE	DEPUBA. MATURALE PROCES SAMLITALN CASEINS, EF CASEINS, EF CASEINS, EF CASEINS, EF CASEINS, EF CASEINS, EF CASEINS, CASE
breed on Assess CR ton years with a second of the control of the c	CAL PROPERTY CONTROL TANT A PROPERTY CONTROL TANT A PROPERTY CONTROL TANT A CONTROL TANTA	Over 629,000 computer professionals read Computerworld weekly.

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

Computerworld gives its readers career updates on today's computer skills and employment issues.

And it does this through special Computer Careers editorial that anchors Computerworld's recruitment advertising section every week. Whether it's informing IBM professionals on their career paths, or updating UNIX experts on what's ahead with their careers, Computerworld delivers the most pertinient and frequent computer career information available in America.

To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

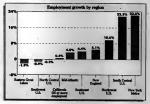
COMPUTERWORLD
Where the qualified candidates took. Every week.

Computerworld/Corptech Career Index

If employment statistics are any indication of an industry's outlook, environmental technology firms are in for a rosy year







How to place your recruitment ad in

Computerworld

It's easy. All the information you need is right here. Just fill out the form and send it in. Or call Lies McGrath at (800) 343-6474 (in MA, (508) 679-0700). (You can even fax the form to us at (508) 620-7739).

Rates:

☐ One Region - \$182.95 per column inch

□ East □ Mid-West □ West

☐ Two Regions - \$228,69 per column inch □ East/Midwest □ Midwest/West ☐ East/West

□ Nat'l Edition - \$251.57 per column inch

All closings for space, camera-ready materials, and telephoned copy for pub-set advertisements are 3 p.m. Thursday (all continental U.S. time zones) 2 working days prior to the Monday issue. Blind box charges are \$100 (U.S.) and \$200 (Foreign).

Copy: .

We'll typeset your ad at no extra charge. Please attach clean, typewrit-ten copy. Figure about 25 words to a column inch, not including headlines. Minimum ad size is 2 column inches. Minimum ad size is 2 column inches. Any special artwork should be en-closed with your ad also. Logos must be submitted on white bond paper for best reproduction.

issue Date(s):	
issued every	Monday)

MAY 11, 1992

COMPUTERWORLD **CLASSIFIED ADVERTISING**

Box 9171 ngham, MA 01701-9171

LOOKING FOR THE BEST

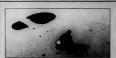
TV ANSWER '

Suppose to treed preferred. Qualified confidence between returned with salety history to:
GILCOR ENTERPRESSES, INC.
Attr: Ma July Reinburst
2021 Mediwent Rand, Same 200
Call Brook 12, 46572
Or fac to 708-753-1-663

ANALYST







If Management Has You Feeling Left in The Dust...

- IMS 00/00 - MPD MILLEMINM/SOT - COPICS - EXPRESS - FOCOS - PC PRINSUMMENTS - SUS - C++ - MUYELL OF 0/5 LIN EXPENTS - CLIENT/SERVEN CHMPATHING - TELDIN - SYBOO - MYS SYSTEMS PURSUMMENS

→ VMS COPOCITY PLOBBIBII USING BCMS and BBB — VBX/VMS with BBB — C+++ MS MIBBOMS

filer competitive salanes and comprehensive benefits. M Rudd or Julie Endon at 414-225-4000 or 1-800-527-2 for Milveulae. Medison, Appleton and Green Bay. furnises. Or send your resums in confidence to: CPU. Dept. 157-32 N. Jackson Street, Milveulae, W. BSSIDE. Equal tunky employer. No entry-less prostoms eveilable.



"...Typically 40+ percent of our total placements are a direct result of our Computerworld recruitment

- Bob Shields Owner & President advertising."

For over 10 years, Robert Shields & Associates has been specializing in the place ment of computer software professionals both in the United States and overseas. The ogency's day-to-day business centers oround finding experienced candidates to meet the specific software needs of their climeet the specific software needs of their ci-ents. According to Owner and President Bob Shields, their regular advertising sched-ule in Computerworld plays an important role in their recruitment success.

"We serve a very broad market - from start-up companies to the Fortune 50 in vir-tually all industries. Becouse our client soft-ware requirements are extremely diverse, it's essential that we have access to a large in a essential that we nove access to a large pool of junior and senior-level software pro-lessionals with a great diversity in expertise. Computerworld is by far our single best source for reaching qualified computer pro-lessionals nationally.

"And to us, national reach is key. Although Robert Shields & Associates is based in Houston, Texos, our membership in Notional Personnel Associates puts us in direct con-tact with over 300 offliate offices all ocross the country. Experience has shown us that only Computerworld delivers the computer market nationally. No other publication

"Since we do work such a broad market, we sometimes advertise in specialty publica tions os well. With Computerworld, however, we consistently get more responses -ond higher quality responses - than with any industry or discipline-specific publication. Because these candidates are much more likely to have the right kinds of experience, typically 40+ percent of our total place-ments are a direct result of our Computerworld recruitment odvertising.

Robert Shields & Associates

"Having been in the DP business since 1963 and an avid reader of Computerworld and an own aredour or Comprehending from the very beginning, I've come to ane conclusion. If you had to choose one publi-cotion that camputer professionals read on a regular basis, it would have to be Comput-erwarld. That makes Camputerwarld a very powerful recruitment ocheritsing vehicle.

"During the 27 years I've been in the com-puter business, the demand for software professionals has consistently outstripped protessionas nas consistently oursingsees the supply. Every industry indicator suggests that this trend isn't about to change. As aur client needs - and our needs - continue to grow, I see Computerworld continuing its role as our best source far reaching computer people on a national basis."

Computerworld. We're helping serious employers and qualified information systems, communications, and PC professionals get tagether in the computer community. Everyweek. Just ask Bob Shields. For all the facts with qualified personnel, cal John Corrigan, Vice-President, Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

COMPUTERWORL



PRODUCT SHOWCASE



Four Bay Removable SCSI Enclosure PYRAGE is designed to be a reliable yet occurrence bay removable SCBI Bubayatem. This attractive untale up to 7.3 1/2" or 8 1/4" SCBI drives and is can

DIGITAL COMPUTER 617-837-7255
CONSULTING Fex 817-837-9641

THE ULTIMATE UNIX TOOLBOX

PIPPOINT PROOF

Distributor inquiries welcome
 30 DAY MONEY BACK GUARANTEE +

PRO/SIM⁷⁸
14201 Memorial Drive, Suite 4
1-713-558-6866
Houston, TX 77079
FAX. 713-558-6857



Bring 9-Track & 3480 Data To Your PCs

Our occupant, light and personal subsystems make it over a foreigning year date on 1,12 leah tage between year PCs, minis and maledwaren. Otherwise least all paperter describes said operating systems. Products are basined by long uncreasion and our comprehensive persons.

by long serverales and our comprehensive service and support program. Call for information and a line notating.

NUCCI ONL DATE 800-858-8559



Get the Word Out!

Spread COMPUTER LITERACY and INTERNAL STANDARDS to every PC user, beginner or expert. Start with our exerci-straining 5,000 definitions and DOS help. Add your own terms. Site licenses for DOS and Windows sent at \$250. Freezons (over it

The Computer Language
Company Inc
SS21 Blook Park Road
1-215-297-5999
Fax: 1-215-297-4424

3270 NOTEBOOK TERMINAL

3270 NOTEBOOK TERMINAL

- Lightweight 3.9 Lbs.
- 10 Hr. Rechargeable
Bettery
Modern wiNAP
- 5270 Compatible
Kentoned wiProtocol

AL do

Featuring: Custom Key Imprinting Full Color Keyboard Templates Keytop Overlays - Language Keyboards P.O.S. Keys - Custom Keyboards

Training, productivity & marketing :
Hooleon Corp. Free
PRO. Bec 226, Dept. CORW 800 9

Free Catalog w 800 937-1337 Fax: 602 634-4620



Computerworld's Product Showcas Sells Your Product Aut at Chare Amer. Vice Position of Marketin

Just ask Duame Aman, Vice President of Marketifor Pre/Sin. According to Duame, "... 50% of all leads generated by our Computerweste Product Showcase advertisements are quickly converted

800/343-6474



Need a preven hardworking Programmer/Anahyst/Project Leader/? Im an independent, with solid experience downstring COSOL to PC No-YELL Networks. Experiese in MS COSOL and BASIC and many applications. Extensive background on IBM main/rames, IMS and minis. Free to travel. Call for more information:

William L. Fisher 1967 Baheck Bird Hillahumb, PA 16237

teher 412-931-3999



GET SMARTI MAKE PROFS EASY

PROFS functions. SmartScreen sites includes a ful 1270 combater that late you access any least function. Cappills Systems, Inc. (404) 552-9910

20 Hardenson Treal (404) 552 (800) 542 (800) 542

MARKETPLACE

Leading brand not only choice

BY ALAN RADDING

nown products to-wing: PC-File from lath-based Button-ware, Inc.; Not-shell Plus II from Chico, Calif-based Iris Soft-ware, Inc.; and Al-pha Four from Alpha Software Corp, in Burling-ton Mass. save.

For others, simplicity as key. For example, the indirect lending department of the First Alabama Bank in Birmingham, Ala, standarfixed on Buttomware's PC-File because of its ease of use. Greg Lee, First Alabama's vice president, found he could easily write programs with PC-File because of its average naisting facilities.

a powerful database management system, its full programming language is best left to experienced programmers.

"When we told corporate we wanted a database, they sent over dBase along with a book just on how to read the manual," Lee re-

Another fan of simplicity in the technical support group at Nielsen Media Research in New
Another fan of simplicity at Nielsen Media Research in New
Political States of the Niel
Political States of the Niel
Political
Polit

mens.

In general, lesser known products in this category tend to be less expensive, with a few excrptions. Paradox and dBase list for S725 and 4809, respectively, with 404 priced at S199.

In the lower tier, Alpha Four comes in at S549, with PC-File aciliags for \$150 and Nutshell Plus II for S355.

The company also likes Su-perCalc's hardware flexibility. It loads in 640K bytes of memory, thereby running on most com-puters — even old latel Corp. 8088-based PCs.

Warv is wise

Buy/Sell/Lease

DEMPSEY. WHERE IBM QUALITY IS SECOND NATURE. · SERIES/1 BUY-LEASE-SELL

. 9370 · RS/6000

· INDUSTRIAL PC · Upgrades

· ES/9000 · AS/400 · POINT OF SALE

· Processors · Peripherals

(800) 888-2000.

Demosey BUSINESS SYSTEMS

55377 Beach Brd. Suite 323 - Huntington Beach Co. 63646 - 1750 Be7-8650 - 665 (750 847-150)

IBM

Executive Infosource!

SELL MOST Machine FEATURE and Peniphenals Telephone: (708) 215-9370 Fax: (708) 215-9992 LDLD

1000 - 3000 - 9000

BUY SELL TRADE RENT LEASE

Am Costos

Data General

MAY 11, 1

CDLA

629,000 IS/DP Professionals see the CLASSIFIED

MARKETPLACE each week. Call for advertising information: 343-6474



COMPUTER SYSTEMS WORKSTATIONS DISKS, TAPES & NETWORKS

410-476-3200

FAX 410-476-3396



Your used computer equipment deserves a second chance.

If you have used camputer equipment to sell, Comput-erworld's Classified Marketerwords 3 Crassined Market place is the best place to da your selling. That's because the Classified Marketplace features a Buy/Sell/Lease sec-tion to help you market your equipment to the very people wha are looking to buy.

And when you advertise in Computerworld Classified Mar-ketplace, you reach a tatal (ABC-audited) audience of aver 629,000 computer pro aver 629,000 computer pro-fessionals wha turn to Comput-erworld for news, information, features - and the Classified Marketplace - every week.

So give your used computer equipment a second chance taday. Ta reserve your space,

800/343-6474 (in MA, 508/879-0700)



IBM

BUY . SELL . LEASE 4381 • 3725/3745 • 3380 • 3480 · Feature Work · All peripherals

- IBM MAQ Salem Computer Group TOTAL COLUMN TERPORTOR

COMPUTERWORLD
CLASSIFIED MARKETPLACE

SPECTRA

(714) 970-7000 (800) 745-1233 (714) 970-7095 A

IBM° ES/9000, RISC/6000 9370, 4381

400, \$/36, \$/38

XEROX

The BoCoEx index on used computers Closing prices report for the usek ending May 1, 1992

	Closing price	Aak	24
IBM XT Model 089	\$300	\$400	\$100
AT Model 099	\$400	\$525	\$150
AT Model 239	\$550	\$650	\$175
AT Model 339	\$600	\$700	\$250
PS/2 Model 30 286	\$650	\$900	\$300
PS/2 Model 60	\$700	\$900.	\$325
PS/2 Model 80	\$2,060	\$2,100	\$1,100
PS/2 Model 95	\$4,200	\$4,600	\$3,300
Compag Portable II	\$450	\$500	\$375
Portable 286	8600	\$800	\$250
Portable 386	\$2,000	\$2,125	\$1,000
SLT 284	\$700	\$900	\$400
LTE 286	\$900	\$1,100	\$500
Dookpro 286E	8600	\$1,000	\$325
Deekpro 386/20	\$1,800	\$2,000	\$1,100
Apple Macintosh Pins	\$600	\$750	\$475
SE	\$450	\$1,050	\$650
Ш	\$2,800	\$3,250	\$2,000
	\$3,200	\$3,600	\$2,460
	\$4,200	\$4,900	\$3,700
DCI IIFX	\$3,200 \$4,200		

Bids/Proposals/Real Estate

OUTSOURCING, REMOTE COMPUTING, NETWORK MANAGEMENT SERVICES

IBM MVS/XA Environment DB2, IDMS/R, Model 204, CICS and 4 GLS

Professional Support Staf

la Conversion r, LED & Impact Printing lication Programming Technical Support AS/400, Asset

May & Speh, inc. 1-800-729-1501

FINANCIAL TECHNOLOGIES Information you can bank on!

Innovative, Responsive, Quality

a few words that describe

the most complete computer processor offering.....

ES/9000, MVS/XA, MSA, DB2, VM/HPO,

TSO, CICS/VSAM and a multitude of third party software

the complete source for ... outsourcing ...

1-800-443-8797 14300 Sullyfield Circle Chantilly, Virginia 22021

VSA Technologies

- A comprehensive mainframe ser provider that you can trust. of Capping costs through innovation of Tailored solutions to customer needs
- of 100% customer service oriented
- ✓ Full service mainframe data center

 ✓ Connections to worldwide packet networks
 - Two Corporate Darre Shelton, Connectical
 Ask for Todd Broadman 1-800-914-8728

ALICOMP, INC. the Computer Services World

Call tell-free, 1-800-752-6527

Computer Services

USE OUR TECHNOLOGY TO YOUR FINANCIAL ADVANTAGE

Hundreds of Large and Small Companies Gain a Competitive Advantage by Using Comdisco's Nation-wide Remote Computing, Information Technology Sourcing and Global Data, Voice and Video Network.

- BMS CFUs and Peripherals
- Pull Range of Systems Software
- chnical & Pinancial Pi

- ancial Asset Ma

Call: Bob Marino 800-227-6584 **OUDIVIO**

COMDISCO COMPLETING ENVICES CORU

Only one will get the job do YOU'RE IN CONTROL

REMOTE COMPUTING . OUTSOURCING

COMPUTERWORLD

mote and On Sin

(212) 886-3600

Classified Marketplace gives you buyers with extensive purchase influence.

In fact, a full 95% are involved in purchase de-cision making for their organizations. They de-termine needs, evaluate technologies, identify solutions, and select products and vendars for the entire range of information systems, as well as related products and services.

So if you're selling computer products and services, advertise in the newspaper that delivers buyers with valume purchasing influence. Advertise in Computerworld's Classified Market-place!

For more information, call (800) 343-6474 (in MA, 508/879-0700)

COMPUTERWORLD ARKETPLACE PAGES

SALES OFFICES

PARKET Controller, New Subsect
PARKET CONTROL Standard Assessment in the CELES - Administration of CELES - CEL

Di Yara President, Manufacturing, Longh Howelft, Circuiter of Publishing Sectional Production Namager, Secondy World CESTREATION Copyrigation Manager, Relieft Wooccol, Traffic Manager, Parl Vestion

LOBAL LEADERSHIP NETWORK

ADVERTISERS INDEX

AAA1 67 Access Media 106-107	Knowledgeware25
Access to Information114	
ALIM	Legart Corp
ATAT Business Communications	Lotus Development Corp 72, 76-77
Services	
ATAT Hetwork Systems 80-61	Marine Herwide
Viet Landon Should wondown on or	
	More Feats11
B I Moyle Associates, Inc	Multi-Tech Systems15
Backman	
Redend International 44.45	NCR 50-51
	MATERIA DE LA COMPANION DE LA
	NETEC 56 NeXT Computer, Inc. 39
Cabletron Systems70	Heat Computer, Inc.
Cendle Corp85	
	Object Management Group41
	Object World
Commeter Associates 120-121	Osedeta 106
Computer Contours Advisors TO	Oracia Corp
Computer Associates 120-121 Computer Systems Advisors 79 Computer 92	Orece Corp
Crystal Point 71	
CW Circulation	Plot Executive Software67
CW CHOLARDON112	
CW Marketing	
CW Recruitment	SAS Institute
Plated Emineral Com	Securio Systems 58
Den Edward Corp.	Colleges Englanging of America CA
Digital Equipment Corp. 34, 115, 108/109 Dow Jenes Services 87	Security Systems 58 Software Engineering of America. C4 Sun Microsystems 84 Sundoft 54-56
DOW JONES SERVICES	Sunfath Ed &
	Sybers, Inc
Effective Marketing	Syncoort 3
EMC Corp	Systems Corner
	Systems Collect
Feet	Texas Instruments
Gain Technology, Inc56	Unifoce
Genicom	O-11004-1-111111111111111111111111111111
	Undey's
	Universal Data Systems75
Hewlett-Packard	U.S. Sprint
	Wark Software
	I Mark College
IBM 82-83	
Information Builders	Wolffeet Correrunications78
Informix Conference Group	WHITE PAPER
	Wyse Technology
Interfer	30-31
Intergraph	
Pl. Systems98	XDB Systems
	Zenith Deta Systems90

Have A Problem With Your Subscription?

We want to solve it to your complete satisfaction, and we want to did it Please write. OCONPLITERWORLD, P.O. Box 2043, Marion, Ohio 43395-2043.

Your magazine salverspion label in a valuable solver magazine salverspion label in a valuable solver magazine salverspion control in the control of the control o

correspondence.
Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should accompanied by your address label, if possible or by a copy of the information which appear on the label, including the coded line. Please allow us works for noncestine time.

Address shows: | Home | Bassess Other Questions and Problems

1-800-669-1002

COMPUTERWORL

STOCK TRADING INDEX



Industry Almanac

ECOMMENDATION CHANGES

93503539933999 93503539933999

Computerworld Friday Stock Ticker

			CLOSING	ICES FROM	MCF 8. 191	12			
TOP PERCENT	GAINERS	TOP PERC	CENTLOSER	S Eur	-	Range		Conte	Charge
Mercusi Tandan Corp BMC Corp Corporate Software Welse flavor try American Corp Description Corp	20 75 22 75 22 20 14 52 15 74 15 50 10 38	Planara incline i American Softwal Ismaga Cosp Storaga Technol Spenialan Softwa Anthrei Cosp Aganus Technolo Halliger Communi	97	100 ATS 100 OTC 100 OT	27.00 27.00 19.00 19.00 27.00	100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Computer Association' Committee Inc. Easer Computers Doed Systems Inc. Braugh Springer Hoger Systems Inc. (L.) Homestern Inc. (L.) Homestern Inc. Homestern	14.50 14.50 28.13 17.75 15.75 22.50 24.00	90000000000000000000000000000000000000
TOP DOLLAR	DAINERS	TOPDOL	LARLOSER	orc	3050	10 25	Intergraph Corp.	14 75	983
BT Cary Playment, Rechnology Adobt Systems to: Merced Saser Core Chaptor Long Inside the Systems BMC Days	325 325 325 325 325 226 286 286	Storage Technologies (SAC Software in Majetter Communication Interes American Software Corp. Exactly in Xeron Corp.	- Cathoria	4 1 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SHEERS SHEER	799200 H 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Interview Inc. Microslindipension Inc. Lagare Corp. Lohan Development Maca Solitivanie Macrosystin Inc. Macrosystin Macrosyst	1100 3450 4135 1776 11450	018888888888888888888888888888888888888
For States Core		1	May a Warrer W	APS OTC	1100	584	Program Technology Program Technology	636	975
Communicatio	ns and Netw	rork Services	Up 1 13		400	2768	Progress Software Corp. Quarterdeck Office Sys.	34 00 15 00	-125
0TC 15:00 6TS NYS 8ETS 5ETS NYS 8ETS 5ETS NYS 44:00 18:00 OTC 42:5 11:3 NYS 50:00 40:25 OTC 40:00 11:25 OTC 40:00 11:25 OTC 40:00 11:25 OTC 40:00 11:25	3 COM/Corp - Americanistic T ATRT - And Communities of Atlantic Corp Ballon, th Corp Ballon, th Corp Ballon, the Community Chapter Corp Corp Corp Corp Corp Corp Corp Cor	caton-Corp. (L.) 179 1 Newmon. ams	020 080 020 080 020 080	7 95 OTC	2000 2000 2000 2000 2000 2000 2000 200	8758778858578 1011587858578	Radiorage Foca Systems Software Publishing Corp. Software Publishing Corp. Software Software Solate of the Art Software Software No. Struct. Commons Research Systems Corp. Systems Corp. Systems Corp. Systems Corp. Systems Academics	90780761075100000000000000000000000000000000	400 00 10 00

STREET ST

ANTENNAME OF THE PROPERTY OF T

#7000MM000MM000MM



COMPUTER INDUSTRY

Lotus loses three execs

DEC tightens CASE links with Andersen

Ideas seeds start-ups for high-tech hothouse

Retailer buys service unit

In the "This takes the

cake" department of PR ideas: ◆ John Lohmeyer, NCR standards architect, celebrates the 10th birthday

of the Small Computer Systems

Q. What one thing do you feel will not change in the next 200

Users of Storage Tek's 4400 Automated Cartridge Systems, which handle 18-track cartridges, have taken to naming their systems, here's a sample! Rans Freeback. Bank of Hawlii. Mount Nevernest, Scandinavian Airline System; Larry, Darrell, Daryl, state of West Yighiir. Robotriever, Boner jarcespace & Engineering; ATLAS (Automatic Tape Loading and Storage), Pennsylvania Blue Sheld: Tage Ape, Bank of America.





Interface, or SCSL

'The Smith & Shows Letter': The Farmer's Almanac, 1992

Q. What, in your opinion, should change the most in 200 ▶Do you have anecdates about yo users, your bass or your job? Know any industry trivia? If so, please contact Lary Zottola or Jadie Naze at (800) 343-6474 If we use your ideas, we'll send you o gift.

INSIDE LINES eacht to be in pictures

Organ to the in prication. By Registrations that could reportedly lend to IBM investing up to \$500 million in Time Warner could give Big Bate a leg up in outsourcing opportunities at the media giant. At least that's what one executive at IBM's ISSC conterring subsidiary and last week factor reading about the negotiations in last Friday's Wall Steer Jearnal. "Maltimedia is an area we'd eventually like to do a lot," the ISSC centority east.

**PEN-109B Bys uses

** Grid's Kirk Crisishank told attendees at the Penbased Computing Conference in Boston last week that
Grid intends to come out this year with a pen-top sys-tem—one that combines keyboard and a pen interface. Zenith Data appears to be working on such a
product as well: It recently hired Grid's pen-top product manager to direct as unmander effort.

Sticks and stones

Details after Source of Oracle's deaktop products division, charged last week that Microsoft's Windows 3.1 cannot stand up to the rigors of cooperative processing. He claimed it crashes more than 10 times daily on the deaks of some Oracle developers. Accordingly, Kish sand, all Oracle tools will be ported to 32-bit Windows NT— not 16-bit Windows 3.1 — from now on.

Microsoft countered that Kish's comments reflected poorly on Oracle's efforts. Dwayne Walker, Microsoft's director for Wundows NT and networking products, said Oracle's problems might end when Microsoft's "Win 22" developments kit abjus in July, providing a single 32-bit API for both Windows 3.1 and Windows NT.

Doing its own thing Systase plans to amounce later this month a NetWare Londable Module (NLM) version of its SQL Server 4.2 RDBMS for Novel LAN., But Sybase, which designed Microsoft's SQL Server for CS/2, will market the NLM on its own. Drawn by NetWare's speed and popularity, Sybase pions Oracle and Gupta as the only independent providers of a database NLM.

Dualing buses?

Densing pusces:

No concrete close to IBM said the firm is talking about building PC systems that run both the AT bus and the MCA bus. Other analysis and sources at IBM said they were not sure what the company might hope to gain from this—if it does it at all—but speculated that it could possibly allow AT users to move to the MCA bus and retain their old perspherals.

Boxing week

➤ A parade of new boxes will emerge from Palo Alto, Califi, next week, as Hewlett-Packard has scheduled several introductions ranging from its proprietary and open minicomputers down through the PC level.

Watch for an overhaul of the HP 3000 and 9000 line and for PCs built on Intel's 486DX clock doubler.

Please becoders

In binders at Penns instruments continued that it recently shall fell high-level cascatives within the self-in exceeding being
The Standisk, Clitists Horth, Manual Crosp 3 discovered St. Mall Passed Crosp with Group of St. Mall Passed Crosp Mall Resident Standish Group of Standish G

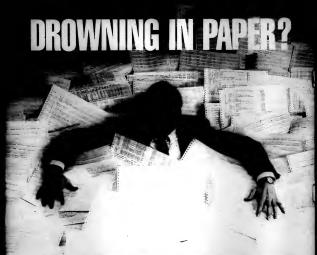
To frame relay users tired of being stuck in traffic, offers the express lane.

We know They told you frame relay could zap huge amounts of data from LAN to LAN with lightning speed. But eventually, you found out they could only send your data in dribs and drabs.

Well, take heart. Sprints Frame Belay service is unlike the others. Because ours doesn't limit the flow of data into the network. Instead, it gives you the capability to send longer bursts or data. Net result: Less delay and greater throughput. Net net result You spend less time sending and receiving data, and more time using it.

To us, it seemed like a better way. That's why we designed our Frame Relay network specifically around your needs. Ultimately, though, it's up to you: Bumper-to-bumper data. Or the fast lane. 1-800-738-1130.

Not just another phone company."



Managing the tremendous output of paper is one of today's most critical and costly concerns. Over 2,500 MVS data centers use \$AVRS/TRMS individually or combined to address this issue. \$AVRS/TRMS, from Software. Engineering of America, provides a total solution to this expensive and resource-consuming problem. \$AVRS/TRMS handles all aspects of report management/distribution, and output management, including production of the property of the second corror resources. SYSLOTE, ACC. Issues and error researces. SYSLOTE, accessible to all levels of personnel through a variety accessible to all levels of personnel through a variety

of full-screen, menu-driven interfaces including CICS, ISPF, VTAM and TSO. Full cut-and-paste, windowing and PC interfaces make \$AVRS/TRMS a flexible and broad-based solution. \$AVRS/TRMS interfaces with all popular security systems and also has multiple levels of internal security.

\$AVRS/TRMS provides a complete and costeffective solution to all aspects of report management/ distribution and output management. \$AVRS/TRMS can control the paper deluge for your installation just as it has for data centers of all sizes and configurations worldwide.

For a no-obligation 45-day free trial or for further information, call Software Engineering of America at 1-800-272-7322.

SOFTWARE ENGINEERING OF AMERICA

2001 Marcus Avenue, Lake Success, New York 11042 (516) 328-7000 1-800-272-7322 Fax: (516) 354-4015 Products Licensed In Over 50 Countries